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**General Linguistics
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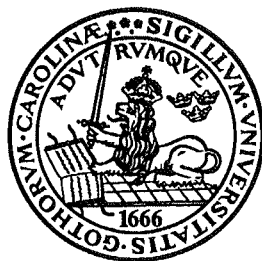
37. 1991

Sheila Dooley Collberg

*Comparative Studies in
Current Syntactic Theories*

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‘The study of syntax, for reasons that have never been clear (to me, at least) has always been a more acrimonious business than the pursuit of sister-disciplines in formal linguistics. Phonologists, morphologists, semanticists, and phoneticians can all survive and cooperate in courteous disagreement, but syntacticians seem to thrive on a more robust diet of anger, polemic, and personal abuse. It may well be that this robust atmosphere leads to progress and to good work in the long term, but there can be little doubt that in the shorter term it tends to obscure certain points of basic agreement and to obfuscate, rather than clarify, the points of real disagreement.’

JAMES MCCLOSKEY

‘Syntactic Theory’

Linguistics: The Cambridge Survey, 1988

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The contents of this volume represent the collected results of over five years of study and research conducted at the Dept. of Linguistics and Phonetics of Lund University. Many people have contributed to my work over those years in numerous ways, and I would like to thank them now for being so generous with their time, ideas, and expertise.

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At home, I have enjoyed the tender loving care of my husband, Christian, my children, Louise and Andrew, and my second mother, Margareta.

Fortunately, Christian's patience has been enough to overcome all the barriers, bounding nodes, and cooccurrence restrictions of any syntactic theory to date. Equally fortunate was the normal 3-and-4-year-old impatience of Louise and Andrew, who simply forced me to forget about my work at times and play enough to go back to research again with enthusiasm.

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Comparative Studies in Current Syntactic Theories

Sheila Dooley Collberg

1.0 INTRODUCTION AND GOALS OF THIS STUDY

Currently there are at least three well-established syntactic theoretical frameworks – Government-Binding Theory (GB), Lexical-Functional Grammar (LFG), and Generalized Phrase Structure Grammar (GPSG) – available to linguists wishing to do research in syntax. Besides these three frameworks there is a host of other theories – Relational Grammar (RG), Referent Grammar (also RG), Dependency Grammar (DG), Functional Grammar (several varieties), Tree Adjoining Grammar (TAG), Cognitive Grammar, Role and Reference Grammar, and Head-driven Phrase Structure Grammar (HPSG), to name a few – all with their own conceptual apparatus, formal notation, favorite problems and ideology. With so many visions of grammar at their disposal, it is important for syntacticians to at least become acquainted with how these theories stand in relation to one another. One must be aware of the viewpoints of other researchers, especially those holding opposing viewpoints, in order to best develop and advance one's own.

This thesis was undertaken with the preceding facts in mind. It compares aspects of the three dominant grammatical theories mentioned above and actively investigates how well each might lend itself to the analysis of a selection of syntactic phenomena from natural language. Four case studies were conducted, each focusing mainly upon the application of principles specific to one of the three theories, although often including cross-theoretical comparisons. Each study also deals with a different major area of syntax.

1.1 The four studies

The studies which comprise the content of this thesis are listed below together with a very short summary of each:

Study I: 'Oblique Subjects in Icelandic Passive Constructions.' 1986. *Studia Linguistica* 40 (1), 67-95.

Non-nominative subjects are here shown to be handled effectively by LFG, which actively makes use of the functional concepts of SUBJECT and OBJECT and the idiosyncratic lexical properties of verbs such as casemarking specifications. The LFG analysis argued for here is especially attractive because it gives insight into the nature of an ongoing change in the casemarking conventions within the class of verbs examined.

Study II: 'GPSG and the Verb-Second Phenomenon in Swedish.' 1987. In V. Rosén, ed., *Papers from the 10th Scandinavian Conference of Linguistics*. Bergen: University of Bergen, 132-146.

Starting from existing GB-based accounts of the verb-second (V/2) phenomenon in Swedish, this paper develops a GPSG account using only the formal apparatus provided by that theory. It may be viewed as a 'translation' study: an attempt to translate an existing syntactic account into the formal apparatus of an alternative theory, in this case GPSG. It is noted that GPSG does not readily offer a natural explanation for the V/2 phenomenon, even though it does allow for a descriptive analysis.

Study III: 'An Expanded-INFL Syntax for Modern Irish.' 1990. *Working Papers* (Lund Univ. Dept. of Linguistics) 36, 57-72.

Current developments in the GB conception of the structure of INFL (inflection) are preliminarily implemented in a syntactic proposal for Modern Irish. In Pollock (1989) it is suggested that the category of INFL be expanded into two component categorial projections, Tense and Agr. Using earlier SVO accounts of the syntax of Modern Irish, such an expanded-INFL analysis is proposed for Modern Irish. The new structure gives promising new perspective on the unsolved problem of the Irish copula; however, there remain questions about whether an Agr projection should be assumed for Irish.

Study IV: 'The Status of Agr in Modern Irish.' 1991. *Working Papers* (Lund Univ. Dept. of Linguistics) 37, 129-160 (this volume).

The syntactic proposal presented in Study III is further refined after an empirical study of the evidence for a nominal Agr node in Irish, and the final structural analysis allows Irish (with nominal Agr but no np-movement) to be classified typologically with respect to Swedish (null Agr)

and Icelandic (nominal Agr and np-movement). The structural continuum exemplified by these three languages may be taken as confirming the central GB claim that the parameterization of structural possibilities allows for new ways of specifying and predicting typological syntactic differences.

Each study is meant to be a reflection of what the current topic of research was in the relevant theory at the time of writing. They are also meant to reflect the accepted methodology, theoretical goals, and style of argumentation found in the published research conducted in each theory. The results of these studies include some new syntactic analyses for data from Icelandic, Swedish, and Irish. However, the most important objective during the course of their writing was to ultimately approach a 'metatheoretical' view of syntactic theory by examining specifically how each theory might be said to both differ from and overlap with the others. The individual case studies served as the concrete means for becoming thoroughly acquainted with the actual workings of LFG, GB, and GPSG as applied in day-to-day research. The metatheoretical conclusions which will be presented are based upon the more theory-specific conclusions of these case studies and, of course, upon insight gleaned from syntactic journal articles, conference talks, seminar groups, and the like.

2.0 THREE CURRENT THEORIES

A complete introduction to the three syntactic theories which have been the object of study here is certainly beyond the scope of this thesis. It is more suited to the format of a whole volume on its own, and there already exists such a volume in the form of Peter Sells' (1985) *Lectures on Contemporary Syntactic Theories*. This book served as a general reference work throughout the course of writing this thesis, and the reader is referred to it for detailed expositions of GB, GPSG, and LFG. Nevertheless, it seems necessary to include some comments here upon those aspects of the three theories which will play the most salient role in the forthcoming discussion.

2.1 Government-Binding Theory (GB)

Government-Binding theory is the principal heir to transformational grammar as it was first conceived of by Chomsky (1957). Its principal predecessor is the Extended Standard Theory (EST), which is the extended version of the standard model outlined in *Aspects* (1965). The authoritative

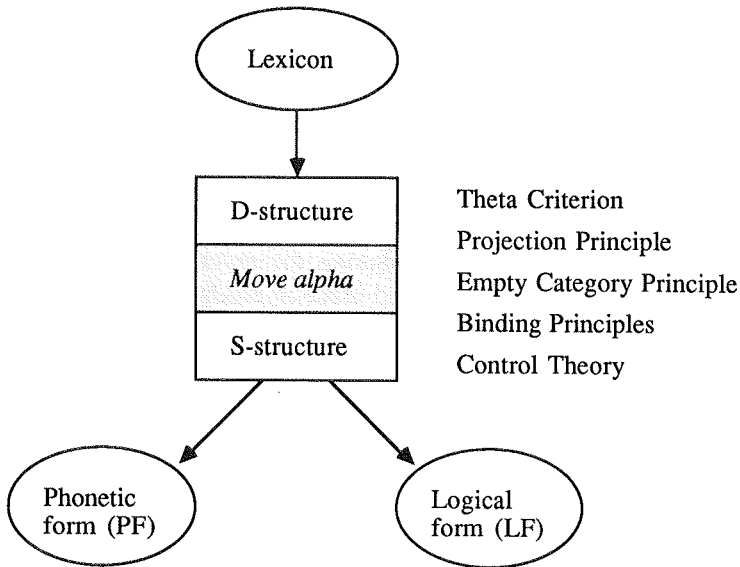


Figure 1. The organization of a GB grammar.

comprehensive exposition of GB theory can be found in *Lectures in Government and Binding* (Chomsky 1981, henceforth LGB), although since its publication there have been many important revisions (Chomsky 1982, 1986). *Linguistic Inquiry* is the publication which serves as the principal mouthpiece for published research in both earlier and current versions of the theory.

It may be said that GB is a grammatical theory which is based largely upon the importance of configurational relations. This is probably a remnant of the earlier TG version of the theory, whose analysis of English relied heavily upon configurational definitions. Although emphasis in GB is upon the identification of *principles* and *parameters* of grammar, configurational interpretation of these is one option. Configurationality is still reflected in nearly every aspect of the grammar, beginning with the choice of the phrase structure tree as the basic unit of analysis. All information in the lexical component of the grammar is geared to the construction of phrase structure trees, and all important derivations in the theory are conceived of as operations upon these trees. The tree structures represent syntactic levels known as D-structure (from the concept of ‘deep

structure' introduced in *Aspects*) and S-structure ('surface structure'), and the derivational operations relating them to each other are known collectively as the transformation *Move alpha*. This transformation is restricted to performing movements of elements from one position to another already existing position in the tree structure. New structural positions may not be created. Movement to create new positions, called *adjunction*, is allowed under certain restricted circumstances. The norm, however, is movement to already existing positions. The final tree structure thus includes both nodes showing the original placement of morphemes as well as nodes to which they have been moved by transformations (cf. Sigurd 1990). The organization of the grammar is usually schematically diagrammed as shown in Figure 1.

The topographical nature of GB is also evident from the terminology specific to the theory. Most terms are concerned with defining either the special status of certain positions in the syntactic tree or the nature of specific configurational relationships among nodes. Kinship terminology serves to define relations of precedence and dominance in tree structures: *sisters* are nodes on the same hierarchic level and sharing the same *mother*; *descendants* are all *daughter* nodes and their descendants. While it would take far too long to fully explain many of the terms of the theory, it is interesting to note that this common configurational characteristic is obvious from the following short list of terms and simplified definitions:

c-command: A node *c*-commands its sisters and their descendants.

government: A node *A* governs a node *B* if *A* *c*-commands *B*, *A* is a lexical head, and *A* and *B* are both within the same categorial projection. An intervening categorial projection will block the government relation.

barrier: A node which disrupts the government relation. Barrier status is variable and depends on a complex array of factors concerning the node itself and the nature of the nodes it dominates: barrierhood can be inherited.

bounding node: Movements of elements effected by *Move alpha* may only cross one such node at a time. They are assumed to be universally NP, S, and S', with some language-specific variation.

In addition to the modules shown in Figure 1, there are a number of systems or principles which work to restrict the grammar's expressive power. These are also all defined in such a way as to work upon the configurational relationships embodied in the syntactic tree structure. Specific remarks upon each of these are best spared for a more in-depth discussion of principles (section 4.4).

Finally, the preoccupation with configurational aspects of language is evident from the kinds of grammatical phenomena which most often interest the researchers working within the GB paradigm. One of the theory's favorite topics is the unbounded dependency construction exemplified in all kinds of *wh*-questions and relative clauses. The volume of literature on this subject alone is monumental, and a great deal of the development of the present form of the theory (including such concepts as barriers, government, and the ECP) stems directly from research upon the behavior of this particular construction. As will be discussed later, the unbounded dependency construction is one which has mostly been deemed unamenable to any other kind of analysis except in terms of constituent structure, so it is not surprising that it has received so much attention from GB.

Word order is another favorite topic in the GB literature. This statement needs qualification, however, because word order is also one of the most problematic areas for the theory. While GB is very keen on examining word order phenomena from languages with readily-identifiable and stable basic word orders (especially SVO and SOV), it has understandably been cautious about so-called free word order languages. Languages like Warlpiri, Malayalam, and Navajo, which figure prominently in the research of more functionally-oriented theories like LFG, are in contrast relatively neglected by GB literature.¹ The principles and parameters research program followed in GB is geared to building analyses of differing word order patterns for languages with relatively fixed word order possibilities (see section 4.4.1 below). Study IV is an example of this type of research. There is also an enormous body of research devoted to the study of how the finite verb is said to move in the syntactic structure in accordance with directional factors of case and theta role assignment (Koopman 1984). The studies of the verb-second phenomenon quoted in Study II comprise a major portion of the research in this tradition.

2.2 Lexical-Functional Grammar (LFG)

LFG is the closest non-transformational successor to the transformational generative forerunners of GB. It is officially documented as a separate theoretical framework in *The Mental Representation of Grammatical Relations* (Bresnan 1982, henceforth MRGR). The basics of the theory are introduced in a paper co-authored by its founders (Kaplan and Bresnan 1982), and the remainder of the book consists of a collection of papers applying the theory to languages such as Icelandic, Russian, and Malayalam.

But even before the publication of MRGR, what was to become LFG was for a time recognized as a different approach within the mainstream of generative grammar proposals and was referred to as 'the lexical-interpretive theory of transformational grammar' or a 'realistic transformational grammar' (Bresnan 1978). The different approach taken in LFG and in these revolutionary movements upon which it was built was an insistence upon the importance of the *psychological reality* of a grammatical theory. Psycholinguistic studies (Fodor, Bever, and Garrett 1974) could not find evidence for any correlation between the amount of processing which speakers actually performed and the number of transformations which generative grammar postulated (the 'derivational theory of complexity'). The psychological reality of transformations was thus discredited, and LFG was the outcome of a search for a more realistic alternative.

A more realistic vision of grammar, in LFG terms, is based upon considering how language users process linguistic data. Competence is a notion which is still important and which still refers to the native speaker's internal tacit knowledge of his language. But for the proponents of LFG, a grammatical proposal can only achieve psychological reality if competence is equated with the representational operations which the native speaker performs in processing. In drafting a psychologically real alternative to transformational grammar, then, LFG must shift the burden of the grammatical apparatus away from the unrealistic syntactic transformations and onto mechanisms which are easier to identify with the intuitions we have of how people process language: for example, by using some type of mental lexicon. Put very crudely, the guiding idea behind the organization of LFG seems to have been that '... it is easier for us to look something up than it is for us to compute it' (Bresnan 1978). This has given LFG its lexical orientation.

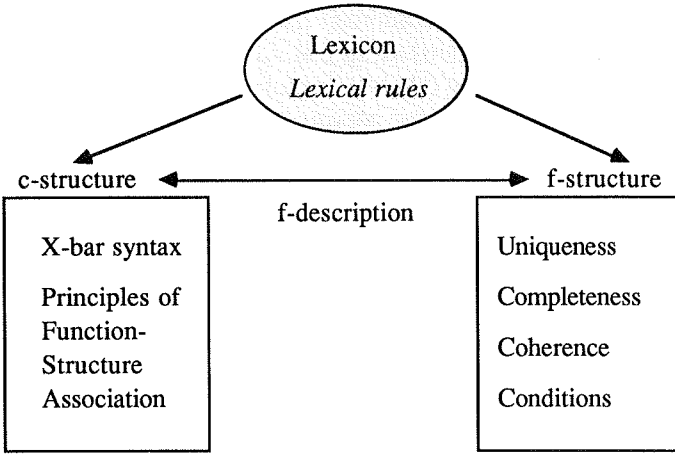


Figure 2. The organization of an LFG grammar.

As the name of the theory reflects, LFG shifts the weight of the grammatical mechanism from the syntactic constituent structure to the lexicon and the entries found there. This is only made possible by developing a new way to encode grammatical relations as primitives rather than as positions in syntactic configurations. Chomsky's decision to treat the grammatical functions subject, object, and direct object as positions in the syntactic structure entails that any changes in these functions must also be expressed in the syntax. The grammatical functions are encoded indirectly and can only be manipulated by transformations. By allowing the corresponding SUBJ, OBJ, and OBJ2 to act as theoretical primitives, however, LFG can encode any changes in grammatical functions directly and avoid the use of syntactic transformations. Constituent structure, called *c-structure*, is consequently given a very minor role in contrast to the role it plays in GB. Instead, functional structure known as *f-structure* is the center of attention. Figure 2 shows how these two components of structure fit into the overall scheme of an LFG grammar.

It is important to note that *c-structure* and *f-structure* are not merely derivations of each other as GB's D-structure and S-structure are (Sells 1985). The two are completely separate representations expressed in different form and obeying different constraints. There is an algorithmic procedure for relating the two by means of an *f-description*, but this is not to be equated with any sort of derivation. It is instead a kind of checking

procedure to see that the two structures match as required. C-structure corresponds roughly to GB's level of PF, since it is mainly concerned with the surface forms of constructions (Sells 1985). It is also the vehicle for expressing language-specific variations, especially those concerning word order. F-structure embodies more invariant and universal aspects of language, since it is framed in the universal set of grammatical functions. As the above model indicates, conditions must be placed on the form of f-structures in order to ensure that no unacceptable ones are generated. These conditions all refer to argument structure and will be discussed in more detail later (section 4.4.2).

All operations on syntactic structure in GB are in effect pushed by LFG into the lexicon and f-structure as operations involving grammatical functions. It is not surprising, therefore, that the formation of passives and control structures, to name just two constructions, all depend in some way upon lexical rules referring to grammatical relations. To summarize, then, the emphasis in LFG is completely opposite to that in GB: location is relatively unimportant, while function is of prime importance. On the psychological plane, the implication is that grammatical functions are directly relevant to language processing, while constituent structure is more of a by-product, and at best of secondary importance.

2.3 Generalized Phrase Structure Grammar (GPSG)

Another non-transformational descendant of transformational theory which developed almost simultaneously with LFG is Generalized Phrase Structure Grammar, or GPSG. GPSG in its original formulation (Gazdar 1979) was an extension of research in theoretical generative linguistics on context-free grammars. This original formulation underwent considerable revision and appeared finally in an official 'handbook' presenting the theory which was titled simply *Generalized Phrase Structure Grammar* (Gazdar, Klein, Pullum, and Sag 1985, henceforth GKPS). This is the version of the theory which is assumed in Study II and which will be discussed here. By the time GKPS appeared, a substantial body of work using the GPSG framework had already been done on about twenty widely different languages.² Since then GPSG has been the subject of much research dealing with questions of generative power, parsing, and natural language processing. GPSG also now has its own direct descendant in the variant called Head-driven Phrase Structure Grammar (Pollard 1984).

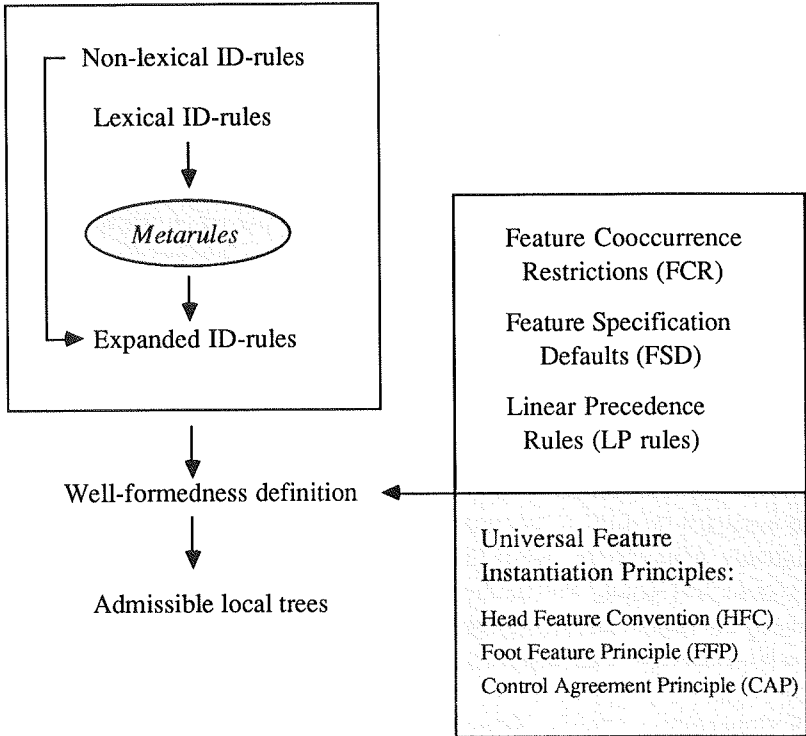


Figure 3. The organization of a GPSG grammar.

The authors of GKPS make a number of statements in their introduction which clearly distinguish GPSG from its two generative relatives, GB and LFG. First and foremost, GPSG is a monostratal theory which does not employ syntactic transformations (GKPS p.10). As a non-transformational theory it is similar to LFG, but its monostratal character sets it apart from the type of multi-stratified theory found in LFG. This is illustrated in Figure 3 with a diagram showing the organization of a GPSG grammar.³

While LFG discards transformations by giving the lexicon the major burden of responsibility, GPSG shifts responsibility to the phrase structure component instead. This makes configurationality an important aspect somewhat as in GB; however, emphasis is not upon the movement of words or phrases between nodes in the syntactic tree but rather upon the spread of

syntactic features from one node to another. It is the use of features which allows GPSG to capture broad generalizations and generate detailed analyses for complex grammatical constructions using only phrase structure rules without transformations.

GPSG is the only theory which has developed a formal definition of syntactic categories as sets of features. Because categories are defined in this way, GPSG can exploit the idea of 'defect' categories, i.e. those which lack some feature which is normally present. For example, we may speak of VP/NP; that is, a verb phrase lacking the usual NP argument. This is the basis for what is probably the most important feature used in the theory, [SLASH]. It is essentially the development of the [SLASH] feature to signal defect categories which has made it possible for GPSG to analyze constructions like questions and relatives without recourse to the transformational means postulated by GB and its predecessors. Understandably, GPSG includes a highly detailed theory of how syntactic features may be defined and how they may interact. The spreading of syntactic features is achieved through the formal mathematical operation known as unification (Shieber 1986) and regulated by a number of principles and restrictions which act as well-formedness conditions. The Universal Feature Instantiation Principles (see 4.3.2) are assumed to apply universally, while the other restrictions (FCR, FSD, and LP rules) are usually language-specific.

The actual phrase structure rules of the grammar are a set of ID ('immediate dominance') rules specifying only the categorial content of a syntactic projection and a number of LP ('linear precedence') rules which stipulate how the content of each projection may be ordered. An example is given below (see also 4.4.1):

- (1) ID: $XP \rightarrow X, Y, (Z)$
 LP: $Y > Z$

The ID rule states that the phrasal category XP will have as daughters X, Y and optionally Z. The LP rule requires that Y stand before Z. It does not specify any order between X and Y, however, so in this case the grammar will allow either the sequence X, Y or Y, X.

As shown in Figure 3, the basic set of ID rules of the grammar may be expanded through application of a special kind of rule called a *metarule*. This abbreviatory device has often been compared to a transformation, and

the relationship between the two will be examined again in section 4.3.1. The final product of the interaction of each ID-rule with metarules and syntactic features is expressed as a single-level syntactic tree (a local tree) which corresponds more or less to surface structure. This is the only level of syntactic representation in a GPSG grammar. There is no equivalent to deep structure or to f-structure, where concepts like grammatical functions or thematic roles are expressed. GPSG is thus truly a monostratal grammatical theory.

A second point separating GPSG from LFG concerns the reasons for abandoning transformations in favor of some other device. While LFG bases its whole research program on a commitment to psychological reality, the authors of GKPS deem this quality uninteresting. The GPSG reason for abandoning transformations was instead a desire to prove that a context-free grammar without transformations was adequate to generate natural language. The motivation was computational rather than psychological. GPSG is not meant to make any claims about the psychology of language, and in fact GKPS labels the question inappropriate to the study of grammatical theories (p. 5). Similarly, GPSG makes no claims about language acquisition, which is a topic of primary concern to GB (see 3.5 below).

What GPSG does concern itself with is formal precision of a kind that is only equaled by the early examples of transformational generative grammar fragments (Wasow 1985, Torris 1988). The English grammar presented in GKPS reflects this clearly: it is meticulously detailed in order to accommodate all the intricacies of the language fragment in question. Troublesome examples are not left aside for the sake of stating broad generalizations. All theoretical principles or concepts are also defined as precisely as possible. In fact, it may be said that GPSG gives formalism a completely dominant role by demanding that the formalism in effect determine the theory rather than simply serve as the means of expressing it (GKPS p. 4). This is evident in the manner in which universals and constraints are handled. Instead of stating these separately as autonomous conditions to which the formalism must be submitted, GPSG requires that they follow as direct consequences of how the formalism functions on the whole (GKPS p. 3). In other words, an impossible grammatical construction is ideally one that simply never arises because the grammatical formalism will never generate it in the first place. The Universal Instantiation Principles in the diagram above are thus not negative statements to filter out

ungrammatical structures but positive ones used to build upon structures and specify them further (Sells 1985; see 4.3.2 and also the discussion of argument structure in 4.4.2). This attention to formal precision and technical detail probably stems from GPSG's origins in research on context-free languages. It continues to make GPSG an interesting theory for mathematical and computational linguists, who may not recognize the same kind of technical concern in LFG or GB analyses.

One final major difference between GPSG and the other two generative theories is the role given to semantics in the overall theory. GPSG allows syntax and semantics to work together in an almost parallel fashion that is not assumed by GB or LFG. GPSG is the only one of the three theories which has a fully-developed semantic component in the grammar. While it is not regarded as a syntactic component like GB's Logical Form (LF), it works much more closely with the syntax than LF may. GKPS devotes two entire chapters to presenting its own slightly modified version of Montague semantics. This explicit semantic theory is not meant to serve merely as a kind of 'post-syntactic filter on well-formedness' (GKPS p. 9). On the contrary, it is actually the driving force behind certain processes which are relegated solely to the syntax in the other theories. For example, it is the semantic relation of functor and argument which controls the process of agreement (4.3.2), and grammatical functions are recognized solely by their semantic interpretation (4.4.2).

3.0 EVALUATION CRITERIA

Before examining each of the theories just introduced with respect to specific aspects, it may be appropriate to begin by reviewing some of the more general evaluation criteria which have usually been applied in judging the value of grammatical theories (Winograd 1983). We may then refer to these criteria when necessary in the course of the more specific discussion.

3.1 Traditional TG levels of adequacy

Since Chomsky (1957) it has been customary to evaluate the adequacy of grammars and grammatical theories on the levels of observation, description, and explanation. An *observationally adequate* grammar correctly specifies which sentences are well-formed in every way and which are not. A *descriptively adequate* grammar does this and in addition specifies the structure of the sentences in such a way as to reflect the native speaker's intuitions about his language. An *explanatorily adequate* grammar

is observationally adequate as well as descriptively adequate and furthermore analyzes language according to a psychologically plausible and maximally constrained set of universal principles. In an explanatorily adequate grammar, the often seemingly idiosyncratic facts of language are made to be natural consequences of general principles. Explanatory adequacy is the highest and the most valued degree of adequacy which a grammar can attain according to this system. It remains a kind of general, all-purpose yardstick by which grammars and grammatical theories are measured, even if other aspects may be considered in evaluation.

3.2 Simplicity

All grammars strive for maximum simplicity. Some analyses are said to 'cost' more because they introduce a higher degree of complexity into the overall grammar. The problem is that simplicity is a concept which cannot be measured easily in any quantitative terms. It may not be equated solely with the number of rules which the grammar includes or the ease with which these rules generate or parse acceptable strings. These factors taken together, however, do help determine the relative simplicity of a grammar. It is reasonable to say that the simplest grammar is one which factors out a large number of individual rules in favor of a smaller number of general principles which can achieve the same results as the individual rules might have done (McCloskey 1988). That this idea is embraced by the three major theories investigated here is evident from the central role of principles assumed in each (section 4.4 below). Simplification in terms of principles eventually seems to reach an upper limit, however. There is a point at which the systematic interaction of the proposed principles becomes complex enough to cancel out or at least overshadow the gains in simplification which such principles are meant to uphold. GB's tight system of interacting principles of case assignment, government restrictions, parametric settings, and categorial projection leads to complicated restrictions upon the final syntactic structure of a string. As shown in Study IV, an assumption regarding one area of the grammar may have far-reaching repercussions for other areas because of the way general principles interact. Thus the setting of one single parameter of functional projection in Irish entails consequences for how the subject position is allowed to be realized in a myriad of constructions. With this example in mind, it can only be concluded that simplicity is itself not a simple concept to measure.

3.3 Generative capacity

Like simplicity, the generative capacity inherent in a grammatical theory is subject to certain conflicting requirements. While it is necessary for the grammatical formalism to be sufficiently powerful to generate all the possible sentences of a language and thus be descriptively adequate, it should not be overly powerful and generate wildly. If it does, then explanatory adequacy will be sacrificed. Ideally, we want the formalism to make a statement about the powers of the human cognitive mechanisms which are employed in using language, and an overly powerful formalism will not make any such interesting statement. In other words, the grammar should only be powerful enough to generate possible natural languages.

Unlike simplicity, however, generative capacity is a quality which can to some extent be measured. For this purpose we can use formal language theory and the classification of language types known as the *Chomsky Hierarchy*. The hierarchy identifies essentially four classes of languages and ranks them as follows from the one demanding the most generative power down to the least: (indexed languages is a recent addition, found in Gazdar and Mellish 1989.)

- (2) Type 0: recursively enumerable sets
 - Type 1: context-sensitive languages (CSL)
(indexed languages)
 - Type 2: context-free languages (CFL)
 - Type 3: finite state or regular languages

If we can classify a language on this hierarchy, then we can also rank the generative capacity of the grammar required to generate it. Assessments of generative capacity have therefore sometimes been used to evaluate the merits of different grammatical theories.

One such assessment is Peters and Ritchie (1973), which charged that the transformational generative grammar embodied in *Aspects* was far too powerful. Because this grammar allowed for unbounded deletions, it was able to generate the most demanding of the languages, Type 0, but natural language does not require so much generative capacity. Subsequent revisions to the theory which effectively restricted this excess of power included the abandonment of unbounded deletions, the drastic reduction of the role of deep structures, and the adoption of the X-bar schema (4.1.2 below). The result is that the present GB version of transformational

grammar is no longer subject to the criticism of being overly powerful. The non-transformational theories developed subsequent to *Aspects* were equally concerned about restricting generative capacity. GPSG is designed specifically to accommodate only context-free languages, while LFG is more powerful and is adequate for generating context-sensitive languages. In fact, LFG is now a more powerful theory than the transformational GB, at least according to the assessment of Berwick (1984).

Nevertheless, estimating generative capacity and using it for metatheoretical comparisons is not always a straightforward matter. If we could correctly place natural languages on the Chomsky Hierarchy, we could also predict what level of generative capacity would be appropriate for a grammatical theory. Unfortunately, it has not yet been possible to classify natural languages. At best we can say that they fall somewhere between the finite state languages and the class of indexed languages now thought to lie between the context-free languages and the context-sensitive languages (Gazdar and Mellish 1989). While most natural languages are adequately described by context-free grammars, there are examples which require greater power, so the issue of the appropriate generative capacity of grammatical theories is still a debatable one.⁴

Another problem is that while we do have the Chomsky Hierarchy and the mathematical methods for attempting some comparisons, these methods may not be directly applicable to evaluating individual aspects of differing grammatical formalisms. For example, the analysis of a phenomenon such as negative scope may be syntactically-based in one theory but semantically-based in another. This difference makes the two theories computationally incomparable (Perrault 1984). As with attempts to measure simplicity, the interaction of individual formalisms with the rest of the grammatical apparatus of the theory cannot be ignored. Nevertheless, a recent attempt at measuring the power of a grammatical formalism may be found in Ristad (1990), where computational complexity theory is used to measure the power of the separate grammatical formalisms in GPSG and consequently revise this power to create a more restricted and natural grammatical theory on the whole. With this analysis, Ristad asserts that the use of complexity theory can be a very fruitful method for uncovering 'the tension between descriptive adequacy and explanatory power.' A different approach is represented by Manaster-Ramer and Zdrovny (1990), where the expressive power of grammatical formalisms is defined in terms of logical formalism. These works indicate that the right level of generative capacity

is clearly still an important evaluative criterion for distinguishing among grammatical theories, but we will say little more about this issue.

3.4 Empirical coverage

The previous section deals with the sheer mathematical capacity of a grammar to generate a particular type of language. Generative capacity is a measure of what the grammar can do in an ideal, model-theoretic world. Coverage, on the other hand, is a more linguistically-oriented term which we may use to refer to the range of constructions which are found in natural language and which the grammar can actually be used to describe. In this sense, then, adequate coverage is an essential prerequisite for achieving descriptive adequacy.

In the model-theoretic world of 'toy' grammars made to generate simple declarative transitive sentences such as 'Kim kissed Lee', a very restricted grammatical formalism may be sufficient to cover all the necessary constructions. But this may not be true if we expand the language sample into the 'real' world and consider example sentences taken from corpora based on actual recordings or texts. The more authentic the language data we try to analyze, the more severely pressed the grammar is likely to be in order to cover the data and provide a satisfactory analysis.

To cope with this problem, linguists seem to have tacitly agreed to pursue a middle course. Usually syntacticians tend to demand only that grammars cover a core of basic grammatical constructions; any theory which cannot cover these will not be taken seriously. This core seems to include passives, questions, relatives, topicalizations, and control structures. Ellipsis, gapping, and coordination are regarded as more peripheral phenomena, and if the grammar does not provide some analysis for these it will not be severely penalized. On the other hand, the ability to cover these peripheral constructions as well as the core cases will certainly be a mark in favor of a theory. GPSG's account of coordination is thus often cited as one of the theory's most impressive achievements.

3.5 Acquisition (Learnability)

Another possible basis for evaluating grammars and grammatical theories has been how plausible a model they provide of language acquisition. This factor is in essence only a special part of what goes into making a theory explanatorily adequate (Wasow 1985). A theory whose analyses and formalisms give a principled, predictive account of how a language-specific

grammar may be learned certainly has more to offer than one which only describes accurately the variety of structures allowed by the language. Theories striving to attain explanatory adequacy consequently consider learnability a very important criterion, and researchers may often build supporting arguments for particular analyses upon how well these analyses may be said to clarify acquisition data.⁵ Indeed, the central concern of the GB framework has been to account for language learning (Wasow 1985), and this concern is expressed in the whole principles and parameters approach prevailing in GB research.

From a slightly different perspective, the ability to account for language acquisition may be seen as an important component of psychological reality. Interest in providing a truer picture of cognitive processing strategies may thus also motivate researchers to appeal to acquisition factors in supporting one theory or analysis over another. The acquisition argument is used in this manner, for example, in Pinker (1982) to evaluate the advantages of LFG over the contemporary transformational theories.

3.6 Parsing and implementation

Since grammatical theories are now figuring in research areas other than pure syntax, new evaluation criteria other than the traditional ones are becoming relevant. For research in natural language processing, for example, aspects of parsing and implementation are more important in evaluation than qualities such as restrictiveness, ease of acquisition, and psychological reality.

Parsing is the computational process of recognizing and assigning structure to sentences. It requires the use of the stored knowledge found in a grammar and a lexicon, although its form need not (and most often does not) correspond directly to the form of the grammar rules. Implementation is made much easier, however, if the parsing algorithm and the grammar can be based on more or less the same rules. Some grammar formalisms have proven particularly suitable for implementation in natural language processing systems. Shieber (1988) characterizes these as formalisms which support rigor, declarativeness, and linguistic felicity. Unification-based grammar formalisms, the type upon which LFG and GPSG are based, possess these qualities and are felt to be among the best choices for a syntactic formalism to be implemented in natural language processing systems (Dahllöf 1989). Therefore, it is not surprising that LFG and GPSG are highly valued by researchers in this field. GPSG has clearly been

developed in a computational milieu, and LFG has very early in its history been implemented and available for experimentation in Kaplan's The Grammar Writer's Workbench. GB has been less attractive, but there exist implementations of it as well (Chen 1990, Giorgi et al 1990). It should be mentioned that some of the central claims of GB's transformational predecessor, EST, were the subject of a now standard work on deterministic parsing (Marcus 1980).

3.7 Theory-internal evaluation criteria

GB, GPSG, and LFG are all concerned to at least some extent with meeting all of the above criteria. However, they are not concerned with meeting each one of them equally well. As Wasow (1985) points out, each theory has instead given more attention to one or another of these aspects in formulating its basic assumptions and principles. GB thus holds the criteria of learnability, restriction of generative power, and explanatory adequacy to be the most important ones. GPSG is more concerned with achieving good ratings for parsing and implementation, and the issue of the generative capacity of grammars is central to the whole history of the theory. Wasow characterizes GPSG as emphasizing observational adequacy strongest, while LFG emphasizes descriptive adequacy more. LFG is perhaps the theory with the most fully-developed theory-internal evaluation criteria. As explained in section 2.2 above, the practitioners of LFG accord a very high degree of importance to the criterion of psychological reality. This is the one factor meant to distinguish the theory from its transformational predecessors. Not surprisingly, the majority of the criticism directed in MRGR at standard transformational grammar is based upon arguments for the psychological implausibility of concepts assumed in that theory.

We may therefore speak of theory-internal evaluation criteria which directly reflect which aspect of human language the researchers of a particular theory feel to be the most important and most interesting. While attempting to evaluate the three theories in relation to each other according to general criteria, we should not lose sight of the fact that they do each have their own standards. How well they have succeeded in meeting these theory-internal criteria must also be a measure of their development.

With these last comments on the differing evaluative perspectives of GB, GPSG, and LFG, we may now turn to a discussion of the more specific details of formal grammatical analysis in each theory.

4.0 CROSS-THEORETICAL OBSERVATIONS

The data which GB, LFG, and GPSG must deal with is, of course, the same. However, there are certainly differences in which particular sets of data each theory has chosen to concentrate upon and how successful each has been in that enterprise. By the same token, it is possible to distinguish areas of agreement among the three theories which may not be readily evident simply upon a first inspection. The next sections discuss some of these cross-theoretical similarities and differences which became apparent during the course of conducting Studies I, II, III, and IV. The focus will be upon how the three theories are similar, and on the basis of these observations, a number of conclusions will be drawn regarding the necessary and desirable characteristics for a theory of grammar.

4.1 Formal notational machinery

At the most basic level of classification, GB, GPSG, and LFG all fall into the same class of grammars. They are all examples of *generative* grammars in that they express grammatical rules in terms of some sort of algebraic formulae for producing acceptable utterances. These generative grammars emphasize differing aspects of grammar in their formal representations: constituent structure, enriched syntactic categories referred to in phrase structure rules, or functional relations. This affects to some extent what kinds of notational terms each theory has assumed, but it in no way prevents the use of some common formalisms.

4.1.1 Grammatical terms

Let us begin by considering the very concrete aspect of the formal grammatical terms used by the three competing theories. Not surprisingly, this is one area in which GB, GPSG, and LFG have much in common. First, it is an obvious but not necessary fact that the three theories have kept intact a whole body of grammatical terminology and concepts and simply put them to use in new and somewhat different ways. Traditional grammatical categories have not been renamed, although there may have been additions to the list (such as COMP, INFL, and most recently Agr and Tense, not to mention the postulation of abstract categories like SLASH or trace). Traditional grammatical terminology has also been adopted on the whole, although there may be some disagreement from one theory to another over exactly how the same term should be defined. Take for example the concepts of *subject* and *object*. For GB these are decided configurationally

and used more or less as cover terms for any category which may appear in the proper configuration. LFG, however, gives SUBJ and OBJ the role of grammatical functions, a central concept to the theory's whole vision of grammar as describing levels of both constituent structure and functional structure. This definitional difference is made clear in Study I in relation to the question of whether oblique noun phrases in Icelandic are truly subjects.

4.1.2 Tree diagrams: Phrase structure rules and X-bar syntax

All three theories assume some kind of tree structure as a means of visually representing the syntactic relationships among the words in a sentence. It should be noted that the tree diagram is by no means the only notational device available for representing syntactic structure. Relational Grammar is one example, where a network structure is used instead. It is significant, however, that the three current dominant theoretical frameworks have all adhered to this analysis. Parenthesis notation is sometimes used to represent syntactic structure as well, but we consider this to be simply one means of spatially translating tree diagrams.

A portion of a sample tree structure from each theory is given for comparison in Figure 4. Each tree illustrates an analysis for the verb phrase of the sentence 'Tommy tossed the bone to Lassie.' Only the verb phrase has been considered, since the inclusion of the subject would require discussion of theoretical differences concerning matters other than pure constituent structure. The overall appearance of these trees is very much the same because the principles assumed to be guiding the combination of elements in them is very much the same. GB, GPSG, and LFG all subscribe to a view of syntactic structure which is based on principles of X-bar syntax (Jackendoff 1977).

X-bar syntax is essentially a restrictive refinement of context-free phrase structure rules using the concepts of head and dependency. Before the adoption of the X-bar schema, it was possible to write acceptable phrase structure rules which could expand a category into almost any sequence of categories. This was because the only requirement on context-free rules is that the left-hand side of the rule contain only one single nonterminal element. The content of the right-hand side is not restricted at all with regard to type, number, or order of elements (Weinberg 1988). Rules such as the following could not be rejected as ill-formed, even though they would be highly unlikely to be representative of any actual language.

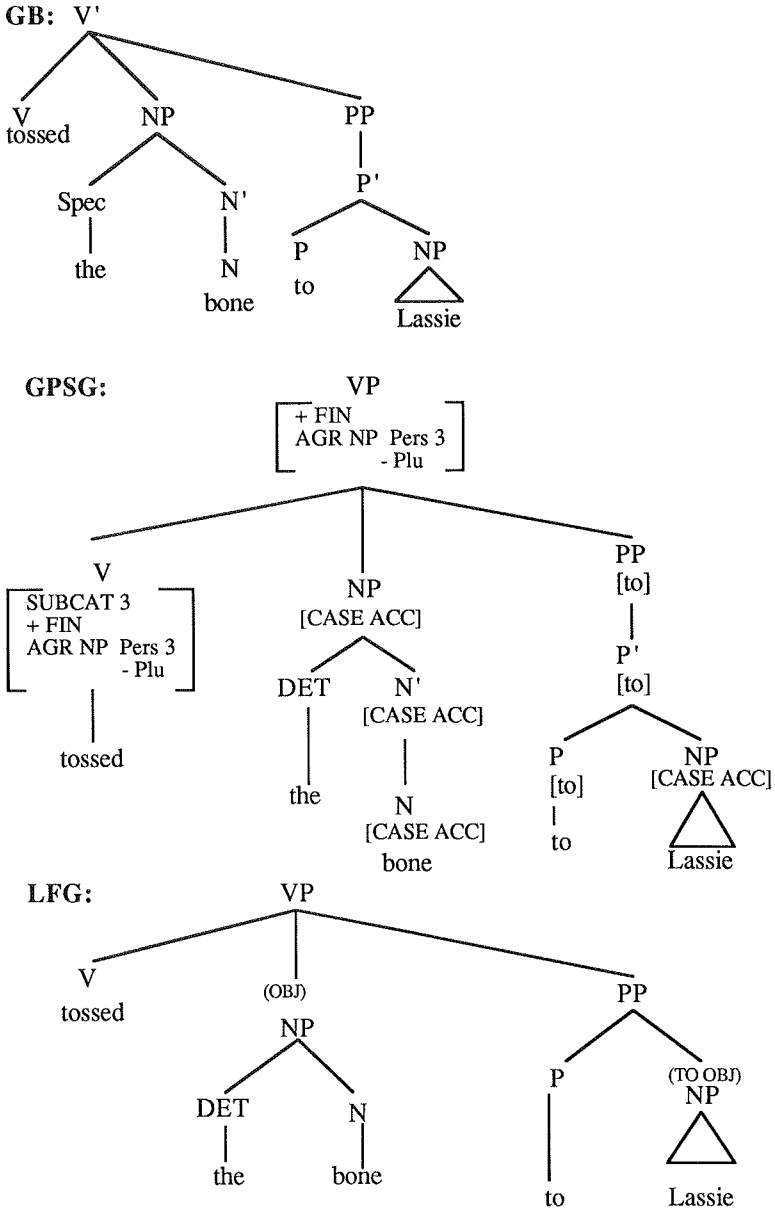


Figure 4. Tree diagrams for a sample VP in GB, GPSG, and LFG.

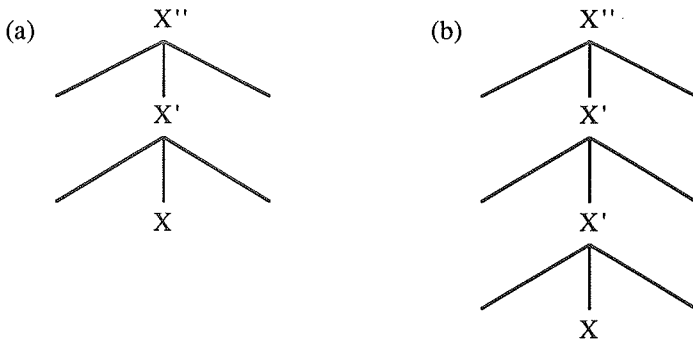


Figure 5. X-bar expansions: (a) basic, (b) recursive.

- (3) a. $XP \rightarrow Q Y Z$
 b. $Q \rightarrow B C D E^*$

In other words, phrase structure conventions were much too unconstrained. Worse than this, they were unable to capture any significant generalizations about universal language structure. X-bar syntax was introduced to remedy this situation by severely constraining the nature of acceptable phrase structure configurations. This was achieved by stipulating that the expansion of any phrasal category would always follow the same schema, regardless of what category was being projected. The currently accepted X-bar schema is the following (Radford 1988):

- (4) $X_n \rightarrow \dots X_m \dots$, where $m=n$ or $m=n-1$

Translated into tree diagrams, this formula will give the two schematic possibilities which are illustrated in Figure 5. The basic expansion, where $m=n-1$, is illustrated in (a), while (b) shows the recursive expansion, where $m=n$. Now it is possible to specify precisely what syntactic configurations are well-formed regardless of the category being expanded. More importantly, it is possible to make far-reaching claims about the structure of all human languages. The X-bar schema predicts that all human languages will have this hierarchical constituent structure, with each successive level being an expansion of the main or *head* category identified with the variable X of the schema. Finally, the sweeping structural generalization embodied

in the X-bar schema may be sufficient to make the specific listing of phrase structure rules superfluous. At least this is the course which has been taken in GB, where phrase structure rules have been abandoned in favor of a total reliance on the X-bar schema as of Stowell (1981).

So although GB, GPSG, and LFG may posit somewhat different processes underlying the generation of a sentence, the final structure of the basic categorial phrases will have essentially the same configurational possibilities in each theory. In other words, the same kinds of phrases will be acceptable to any one of the theories. A verb phrase cannot expand into anything other than a verb head plus possibly some other category, whether one is working in GB or GPSG. The same is true of LFG, except that structural tree diagrams are given a different status in the overall make-up of the grammar. They are only meant as diacritics illustrating word order configurations, hence the name 'c(onstituent)-structures' as opposed to 'f(unctional)-structures'. They do not figure as prominently in the grammatical apparatus as do the tree structures of GB and GPSG, where sheer configurational relationships play a leading role in realizing such things as case assignment or antecedent-anaphor dependency. These phenomena are realized instead in the lexical representation in LFG. The c-structures of LFG, therefore, are only of secondary importance, and word order is, as may be expected, not as great a concern to LFG researchers as to those in GB and GPSG. This is one of the qualities of LFG which is exploited in Study I, where it is found that the configurationally-dependent GB cannot accommodate the intricacies of Icelandic oblique case assignment.

It must be stressed that while all three theories analyze syntactic categories in terms of X-bar syntax, they do differ as to what the inventory of expandable categories may be and as to what categorial analysis they may assume for certain constructions. This is the source of disagreements among them as far as constituent structure is concerned and especially where the status of the sentence on the whole is concerned. This controversy has been discussed many times before, both within the framework of GB theory and between the different grammatical theories, in the form of a debate about which category should be identified as the head of the sentence (S).⁶ The answer given by each theory is very much a reflection of its notational apparatus.

LFG takes the neutral stand and declares S to be exocentric: there is no head of S in LFG. But if forced to identify the most important element in

the sentence, LFG would probably choose the verb. The verb may be said to be the heart of the syntactic clause. It is the lexical qualities of the verb which determine its theta-assigning and casemarking properties, or which functional arguments are allowed, and these properties in turn affect the possible word order configurations which may result. It is also the verb which carries the PRED attribute used in semantic interpretation.

GPSG is clear in giving the verb the status of head of S. In the phrase structure rules of the theory, S is only an alias for the category V[2]. As in LFG, it is the lexical qualities of the verb, here for instance expressed as a SUBCAT feature classification, which determine much of what the final structure will look like.

The supremacy of the verb is not quite so obvious in the GB framework, where the abstract features [finite] or [tense] in INFL might be equally strong candidates for heading the sentence. Nevertheless, GB researchers are now tending to accept that the VP is the basic unit of structure in the first stages of language acquisition (Platzack 1990, Guilfoyle 1990). Since the subject is now assumed to arise in Spec-VP, the VP in its D-structure form does contain essentially the whole of any sentence. The functional categories in INFL seem to be acquired only later, and, as shown in Study IV, are mainly concerned with placing the verb correctly in the surface structure or determining what shape the subject may take: nominative, oblique, expletive, or null. Despite these by no means trivial responsibilities, it is still the verb and not INFL which is responsible for the selection of all the arguments of the sentence. As shown in Study III, the role of INFL is more as a meeting point for morphology and syntax, thus ensuring that the underlying concepts carried by the verb receive the correct surface form. We might say that the verb dictates, while INFL translates.

Thus while GB basically accepts the same views as LFG and GPSG about the importance of the verb, it continues to maintain that INFL is the head of S. The key to understanding this seemingly contradictory stance seems to be in the observation that there is no equivalent to INFL in GPSG and LFG, and that the phenomena connected by GB with INFL are accounted for by some other means in GPSG and LFG. INFL is considered to be the head of S because it has been created largely for the purpose of giving some account of the distribution of tensed and untensed clauses. It has been given responsibilities which are either handled by other means in the two other theories or which have no meaning at all for them: specifically, the

possibility of np-movement assumed by GB to occur with passives and so-called Raising constructions, movements which are totally absent from LFG and GPSG.

4.1.3 Syntactic features and abstractness

In addition to X-bar syntax, another notational convention used by all three theories is the concept of syntactic features. Common features are typical inflectional features such as [number], [person], and [gender], which may serve as annotations for overt morphological elements. Also common in GB and GPSG are more abstract or complex features such as [finite], [tense], and [AGR] (agreement). GPSG's feature [SLASH] is also a more abstract feature of this type. [AGR] and [SLASH] are complex features in that they themselves may take as values a whole matrix of other features.

Features can provide a good vehicle for discussing the degree of abstraction inherent in a grammatical theory. By *abstraction* is here meant to what degree the syntactic features of the grammar find a readily identifiable overt counterpart in unanalyzed natural language. Features can be ranged along a continuum according to how abstract they are. At one end of the continuum are features such as [number], [person], [gender], [tense], and [finite], which are very often (but not always) readily identifiable with contrasting morphemes in many languages and are thus not abstract. A more abstract feature is the complex [AGR]. It, too, is identified with an overt morpheme or morphemes from the preceding list, but its function is actually to signal the *relationship* holding between the two syntactic elements which bear these morphemes. In this sense, then, it is a 'discontinuous' or 'distributed' feature which does not find one single counterpart but must refer to two.

Somewhat like [AGR] is the feature [INV] (inverted), which appears in Study II as the trigger for verb movement in Swedish. It also refers specifically to a relationship between syntactic elements, in this case one of linear precedence. In addition, it must refer to what is recognized as the normal default linear order of the same elements in the grammar by implicitly referring to a feature specification default (FSD) rule. Thus [INV] is used to signal what is really a threefold relationship between not only syntactic elements but also syntactic rules. This certainly qualifies it as an abstract feature.

At the most abstract end of the continuum we find the complementary features [SLASH] and [NULL], which GPSG uses to signal long-distance

dependencies of the type found in questions. [SLASH] is a relational type of feature indicating that a phrasal category has been deprived of one of its normal constituents, while [NULL] marks the absence of any content in the missing category. As signals of the absence of an overt syntactic element, these two features are thoroughly abstract.

GPSG is the theory which has exploited the use of syntactic features most avidly, in essence giving them the major burden of responsibility for bearing up the syntactic structure. It is these syntactic features and the principles for their spreading from one category to another which are used to enhance the structures admitted by the ID rules of the grammar and build the actual structures in syntax. ID rules and the X-bar schema provide the blueprints, but the interaction of syntactic features have the final word. Not surprisingly, GPSG has to assume a long list of features⁷ along with principles guiding how they interact with one another (see 4.3.2). This preoccupation with features and the freedom to draft new ones as required may be criticized as bordering dangerously on paving the way for ad hoc solutions. This criticism finds some support in the result of Study II, where it is shown that features can always be manipulated to describe the idiosyncrasies of word order in Swedish.

On the other hand, the postulation of more or less abstract grammatical features such as [finite], [tense], and [AGR] is supported by the data examined in the studies of this thesis. Without reference to such features, it becomes immediately more difficult to explain the intricacies of verb placement and a host of syntactic phenomena associated with the character of the surface subject position. This is demonstrated clearly in both Study II and IV. Further research on the verb-second phenomenon in continental Germanic languages has shown that it is essential to make use of the abstract feature [INV] (Reape 1990). The use of at least some abstract features seems to be unavoidable if the grammar is to be maximally simple in its formulation while descriptively and explanatorily adequate in its coverage of possible syntactic constructions.

4.2 Modules and levels of representation

The degree of abstraction inherent in a theory may also be seen as a function of what modules and primitives are assumed and how we may divide one module into several different levels of structure. A *module* is defined here as one 'area' of the grammar which is responsible for the description of a major aspect: traditionally, lexicon, phonology,

morphology, semantics, and syntax. Each one of these modules may be decomposed into a number of substructures, defined here as *levels*.

Seen from this perspective, GPSG is the simplest theory. Only one empty category is assumed, and all surface structures are produced directly from the module of phrase structure rules of the grammar. There is a hint of an underlying lexical module of structure in the use of features such as SUBCAT and Q (interrogative), but these are in essence a shorthand device for identifying sets of items which will always receive a particular syntactic treatment. There is no provision for expressing abstract concepts of case and thematic roles, which do appear in GB and LFG. There is a well-developed semantic module, for GPSG is the one theory among the three which has taken the clearest position about how the semantic interpretation of sentences should be built. But for the purpose of comparison I am only considering how the theory handles syntactic structure alone, and in this light GPSG is clearly a single-module theory.

LFG involves more division of labor in that in addition to a lexical module it assumes two structural modules: constituent structure (based on X-bar syntax) and functional structure (allowing operations on functional entities such as SUBJECT and OBJECT). The functional structure expressed also in the lexicon is by far the more dominant of the two, yet the constituent structure is necessary as the surface expression of the functional operations which have occurred. One could argue that LFG is the most abstract of the three theories, considering that all the real work of the grammar is done in the lexicon, 'beneath the surface' of the actual sentence as it appears in linear speech. In fact, Bresnan (1982) characterizes LFG as more abstract than the then current versions of transformational theory and stresses that this abstractness allows it to more adequately deal with constructions like the passive, which are dependent upon grammatical function relations and not surface constituent structure alone. As mentioned earlier, the syntactic configuration is not as crucial to the final analysis in LFG as it is in the other two theories.

GB, however, represents a considerable increase in abstractness from its earlier transformational predecessors. GB is the most abstract of the three theories, if one considers simply the inventory of abstract elements which have a job to do. GB assumes three levels of syntactic structure (D-structure, S-structure, and Logical Form), a lexical module, at least four empty categories (wh-trace, np-trace, *pro*, and PRO) which figure solely in the syntactic machinery of the theory with no overt expression, abstract

syntactic categories or features (Tense, Agreement, and Finiteness), and the abstract concepts of case and thematic relations. The S-structure or surface configuration of a sentence may thus contain many abstract elements which have no counterpart outside the confines of the theory.

With the preceding facts in mind, we might ask whether a theory really needs to assume many modules consisting of separate levels of grammatical structure. Is the one module of phrase structure rules postulated in GPSG able to capture as much as the multiple modules of constituent structure plus functional structure or the multiple modules of both lexical and constituent structure in GB and LFG? The answer to this question seems to hinge upon the expression of case and thematic relations. LFG expresses them within functional structure, while GB places thematic roles on a level of the lexicon and case on a level of syntactic structure (S-structure). The assignment of thematic roles and abstract/morphological case play different but equally important roles in determining the ultimate form of a grammatical construction. This is most evident in Study I, which deals directly with casemarking phenomena in Icelandic. This study especially illustrates the importance of case and theta concepts by showing how reference to them can be used to explain diachronic developments in progress. The importance of case and theta concepts is a secondary theme in Study IV, where the consideration of nominative subjects as opposed to oblique subjects is used as evidence to support the claim that Agr is present in Modern Irish. Finally, the sheer absence of case and theta concepts in GPSG provides further evidence in Study II for their importance to a fully explanatory grammatical theory. It is evident from Study II that GPSG is sufficient to construct a descriptively adequate analysis of the verb-second phenomenon in Swedish, but that this analysis does not offer much in the way of explanatory value. If explanatory adequacy is the highest standard by which we should continue to measure the value of grammatical analyses, then it seems necessary for a theory to assume at least the multi-level approach represented by GB and LFG. There are definite advantages in giving concepts like subject, object, theta roles and abstract case their own place in the system of the grammar. We can only conclude that GPSG suffers from the lack of a level of structure at which thematic relations can be expressed and serve to figure in restricting or allowing certain syntactic configurations. While case features are on GPSG's notational list and can easily account for the possible appearance of overt morphological case (as

indicated in Figure 4), they are not the powerful abstract case features of GB or even LFG.

4.3 Transformations under any name

Since GB, LFG, and GPSG are all generative theories of grammar, they may all be said to find some of their roots in the original conception of generative grammar introduced in Chomsky's *Syntactic Structures*. Only GB, however, professes to have retained the transformational component which was argued for there, albeit in a different form. For various reasons, the other two theories have categorically denounced the desirability of having a transformational component in the grammar. LFG has taken the stronger stand in rejecting transformations because they are not psychologically real, while GPSG advocates seem to feel that grammatical phenomena can simply be expressed more interestingly in other ways. The generative theories thus appear to be split into two camps on the issue of transformations, but this apparent division is well worth closer inspection.

In *Syntactic Structures*, the notion of a linguistic level played an important role in Chomsky's proof of the superiority of transformational grammar. It was first established that direct representation of language was not possible: one must assume several different levels of analysis, each with its own finite inventory of analytical concepts. Each level in itself is simple, but in combination they can adequately represent the surface complexity of the unanalyzed language. This is the principle upon which the idea of a transformation is based. As Chomsky tried to demonstrate, a finite-state Markov type grammar and a one-level context-free phrase structure grammar are equally inadequate for representing the complexity of a natural language like English. But if we assume an additional mechanism — transformations — then phrase structure rules and transformations can be simple enough in themselves yet powerful enough together to handle English.

Thus the need for separate linguistic levels working in combination with one another has been sufficiently proven, and any theory claiming to function without some intermediary mechanism is probably deluding itself. The delusion stems from taking the traditional definition of a transformation too narrowly. Chomsky (1957) originally defines a transformation as a rule which '*... operates on a given string ... with a given constituent structure and converts it into a new string with a new derived constituent structure.*'(p. 44, italics mine). Transformations by this definition, then, change configurations of constituents into new

configurations, and GB's one remaining transformation, Move alpha, is accordingly interpreted as a 'true' transformation.

But the fact that Chomsky formulated his (1957) definition in terms of constituent structure only stems from his choice of phrase structure configurations as the fundamental linguistic level of description. Had he chosen to use constructs other than strings, then his definition would have been framed in terms of them. For the purpose of comparing the current set of existing generative syntactic theories, we need a more general, higher-level, construct-neutral, and theory-neutral definition of a transformation which subsumes Chomsky's original one. To avoid confusion, we might want to label this hyponym something like *derivational device*, although it is true to the original conception of the transformation. I suggest the following definition:

- (5) A derivational device DD operates on a given unit of the *first, more restricted level of a linguistic construct* and converts it into a new structure of the type found on the *second, more explicit level of the same construct*.

The italicized portions of this definition are meant to coincide perfectly with those in the original definition quoted above, so that the original formulation describes only one specific kind of transformation, not the only kind. This new definition captures the point made in *Syntactic Structures* about the relative powers of different types of grammatical theories. Any theory will necessarily be forced to assume some convention of derivation between the basic primitives of the more abstract level of analysis and the more concrete level of analysis corresponding to the 'surface' form: as defined here, between the first level and the second level. The choice of the units postulated for each level — 'deep' constituent structures, grammatical argument function structures, lexical structures, immediate constituent rules — is irrelevant. None of them is sufficient alone to generate all of the complexities found in language. There simply must be intermediary devices.

A transformation by this definition, then, is not something found solely in analyses labeled transformational-generative. Derivational components are unavoidable in the other frameworks as well, no matter how these theories choose to identify them. Other theories which present themselves as non-transformational may in reality contain 'hidden' transformations in the form of some kind of derivational device. This last statement is

inflammatory to say the least, since other theories have spent so much time and energy emphasizing precisely how they manage *without* the likes of transformations. I must therefore provide proof to support the revised definition of transformation by demonstrating how it is exemplified in GPSG and LFG in the form of some sort of derivational device.

4.3.1 Metarules

Let us consider GPSG first, since it purports to offer the non-transformational alternative *par excellence*. All structure is built directly from immediate dominance (ID) and linear precedence (LP) rules, with the help of syntactic features. There is one derivative device, the metarule, which even the founders of the theory admit resembles a transformation. Sells (1985), in his presentation of GPSG, also notes this resemblance, but supports GKPS by saying that the analogy is merely a helpful way of understanding the device. The authors of GKPS take great pains to stress that the metarule is NOT to be equated with a transformation. They understand transformation in the traditional Chomskyan definition, and in that sense their arguments are justified: the metarule is an operation upon rules, and not upon strings. But according to the construct-neutral definition of transformation advanced here, the metarule is also clearly a derivational device. It changes one or a set of the basic ID-rules of the grammar (the first level of analysis) into a new set of rules (the second, more expressive level). The metarule is labeled within GPSG as an abbreviatory device: it simplifies the grammar considerably by capturing generalizations across construction types. This is equally true of the traditional transformation. While the former abbreviates the set of rules, the latter abbreviates the set of structural configurations. Rules or trees, the effect is the same, and by the definition (5) above, the metarule is a derivational device which is necessary to achieve an adequate level of expressive power in the grammar. It is revealing that the metarule is needed in GPSG to accommodate some of the same phenomena originally cited by Chomsky in 1957 as proof of the need for transformations on strings, namely the passive and the behavior of auxiliaries. It may also be noted that the greater portion of the responsibility of metarules is to uphold long-distance dependencies through the introduction of the feature [NULL] and a series of its counterpart feature [SLASH]. These features function in a fashion parallel to their transformational GB counterparts, trace and chain coindexation, as will be discussed in more detail below. We may conclude that metarules are indeed 'hidden' transformations in the sense that they are derivational devices by

the definition in (5). They aim at predicting the existence of some structures on the basis of others.

Seen in the light of definition (5), it is only natural that the metarule is easiest to understand in relation to Move alpha. Their kinship is undeniable. After all, the objects upon which they operate are definitely related, trees being simply graphic interpretations of phrase structure rules. The concepts on the first level of description in both GB and GPSG are superficially similar.

4.3.2 Universal Feature Instantiation Principles

ID rules are not the only primitives in GPSG. As discussed above, syntactic features have a primary role to play in the theory. They, too, are subject to manipulation by means of a theory-internal derivational device. For syntactic features, this derivational device may be identified with the set of Universal Feature Instantiation Principles presented in GKPS, chapter 5.⁸ Specifically, these are known as the Foot Feature Principle (FFP), the Head Feature Convention (HFC) and the Control Agreement Principle (CAP). ID rules actually make very little reference to syntactic features and thus permit quite a wide range of admissible structures to be projected. These structures are only very general ones, however, which are made more specific through the instantiation and spread of additional syntactic features throughout the tree. The FFP, HFC, and CAP are used to control this instantiation and spreading so as to produce only admissible structures. The expression of these three principles as conditions upon tree admissibility tends to obscure the fact that they are all concerned with the basically derivational process of fleshing out underspecified feature matrices. By our definition, this qualifies them as a derivational device. Just as we have seen with metarules, the FFP, HFC, and CAP can accommodate effects which are comparable to those attributed by GB to transformations.

A revealing example is provided by the operation of the CAP in the construction of what are generally referred to as Raising constructions involving verbs like *seem*. The CAP is a semantically-based principle which comes into play whenever there is a functor-argument relation. The functor is made to agree with its argument, which is identified as the controller, and the agreement relation is mediated through the syntactic feature [AGR]. For the verb *seem* in examples like the following, the ID rules will allow us to build the structure shown in Figure 6.

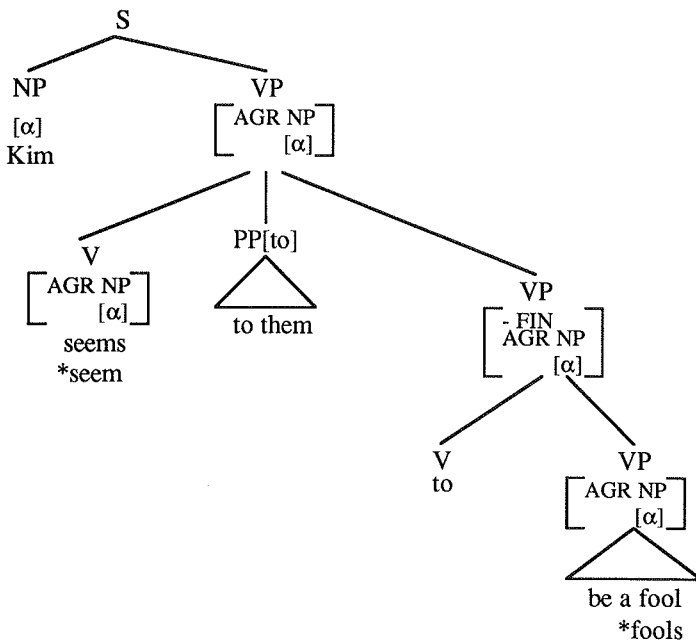


Figure 6. GPSG tree illustrating the operation of the CAP.

- (6) a. Kim₁ seems to them₂ to be a fool₁.
 b. *Kim seem to them to be a fool.
 c. *Kim₁ seems to them₂ to be fools₂.

This structure sets up a functor-argument relationship between the VP predicate and the NP subject. The CAP will therefore be called into play to instantiate the feature [AGR NP[α]] on the VP, and the α value will assume the value of the controller, in this case the subject NP. The value of the controlling NP will in this manner spread from its origin in the structure to other feature matrices previously unspecified for an [AGR] feature. This feature spreading is able to capture the same Raising relationship which GB analyzes as arising through a movement transformation. For GB, the subject NP is raised from the lower infinitive VP up into the matrix subject position, leaving a trace behind. This trace is identified with the same morphological features as the NP to which it is coindexed, much like the [AGR [NP α]] feature complex. Both the GB trace and the GPSG [AGR]

feature act as annotations upon structure to signal the functor-argument relationship between the lower infinitive verb phrase and the subject NP. Establishing this relationship is important to explaining why the finite verb must agree in number with the subject (6b) and why the infinitive cannot be controlled by any other NP in the sentence (6c). The CAP is thus one example of how feature instantiation is in essence the extension of underspecified categories into more specific ones.

4.3.3 Lexical rules and special phrase structure rules

The c-structure trees of LFG are in one sense the objects comprising the first, more restricted level of analysis. There is, however, another more fundamental level in LFG, where basic concepts are of an entirely different nature. As noted before, LFG's interest in psychological reality has led to the postulation of theoretical primitives dealing with thematic relations (AGENT, GOAL, LOCATION) and grammatical functions (SUBJ, OBJ, OBJ2) rather than with constituent structure alone. As we shall see, in LFG there is not just one but a number of devices which might be identified as effecting derivations from one level of structure to another, more expressive level.

Because of LFG's emphasis on the role of the lexicon, many of the derivational processes which figure in the syntax proper of GB or GPSG are relegated by LFG to the lexicon instead (Sells 1985). The passive, as illustrated in Study I, is a case in point. Passive in LFG is the work of a lexical rule which changes the grammatical function assignments for the SUBJ and OBJ and in addition specifies verb changes. It derives the passive construction as a special case from the default lexical entries of actives. In its formulation in Bresnan (1982), it does essentially the same work as the GPSG Passive Metarule (GKPS p. 59) or the GB np-movement. It, too, can arguably be classified as a derivational device. The only difference is that this time we are deriving special new lexical rules from existing basic ones, not phrase structure rules from rules or strings from strings. A lexical rule is given the same derivational responsibility as GPSG gives to a metarule and GB to a transformation. We may therefore conclude that the lexical rule is in LFG a derivational device, and this seems only fitting given that the lexical entry is taken to be the primary construct in the theory.

Another possible example of a derivational device in LFG may be found in the phrase structure rule introducing long-distance dependencies and discussed further below (4.4.3). A phrase structure rule rather than lexical

rules must be used because long-distance dependencies are one grammatical phenomenon which even LFG has chosen to express at least partially in terms of constituent structure. Functional relations are not the conditioning factors here; rather, it is arguably c-structure configuration which is assumed by Kaplan and Bresnan (1982) to restrict possible dependencies.⁹ This rule bears a certain resemblance to the Slash Termination Metarule and Linking Rule used by GPSG for the same purpose. The rules are given below for comparison.

(7) GPSG Slash Termination Metarule 1 (GKPS, p.143)

$$\begin{array}{l} X \longrightarrow W, X^2 \\ \quad \downarrow \\ X \longrightarrow W, X^2[+NULL] \end{array}$$

GPSG Linking Rule

$$S \longrightarrow XP, H/XP$$

(8) LFG introduction of long-distance dependency

(Kaplan and Zaenen 1985)

$$\begin{array}{l} S' \longrightarrow \quad XP \quad S \\ \quad \uparrow \text{(TOPIC)}=\downarrow \quad \uparrow = \downarrow \\ \quad \uparrow \text{(FOCUS)}=\downarrow \\ \quad (\uparrow \dots) = \downarrow \end{array}$$

Both (7) and (8) describe long-distance dependencies in terms of phrase structure rules including variables over categories or functions. In the GPSG metarule, *W* is a metavariable ranging over a set of phrasal categories and representing what would normally be the *wh*-element. In the Linking Rule, the variable *XP* represents the *wh*-element and 'links' it to an identical missing category somewhere within the head (*H*) of *S*. In the LFG rule, the notation '*...*' ranges over a set of grammatical function names, while the *XP* variable allows any phrasal category to be associated with the TOPIC or the FOCUS function. The arrows connect the TOPIC or FOCUS to the matching grammatical function in the *f*-structure. While the LFG rule is not specifically presented as a metarule device for generating new phrase structure rules, this is in essence what it does. Like the GPSG metarule, it is a kind of abbreviation for the list of phrase structure rules which would be

needed to generate all of the specific examples of long-distance dependencies that would be possible. It should therefore also be recognized as a derivational device within LFG. However, it is not the primary one, since it is framed in terms of constituent structure, which is not the focus of interest in the theory. The lexical rule is rather the canonical derivational device for LFG. The rule for long-distance dependencies is essentially a very special case of phrase structure rules and at first glance might seem a rather cumbersome and uncharacteristic apparatus for LFG. In comparison with the GPSG metarule, it has been criticized as offering less by way of both descriptive adequacy and explanatory adequacy (Steedman 1985). But with the theory-internal goal of psychological reality in mind, at least one aspect of this analysis now seems particularly fortuitous for LFG. Recent ideas about the dependencies involved in these constructions favor the direct association of the displaced element with the verb (and hence its grammatical function) rather than with some empty element tied to a position in the syntactic configuration (Pickering and Barry, forthcoming).

One might ask whether we should identify a third type of derivational device for LFG. This would be one which transforms the relatively simple constructs of c-structures into the more expressive constructs of f-structures. Such an intermediary device would not, however, be of the same type as the metarule, Move alpha, or the lexical rule. It would involve passage from one module of the grammar to another, not simply from one level of the same construct to a more expressive level. In MRGR it is stressed that c-structures and f-structures are not simple derivations on each other but separate constructs obeying their own laws. While the mapping between c-structures and f-structures is functional in the mathematical sense of the word and bi-directional (we can define inverse functions), these two kinds of structures are not related to each other in the same manner as, for instance, D-structure and S-structure. This helps us to clarify the definition of derivational device (DD) which was advanced in (5). The DD is not to be equated with just any derivation or mapping between grammatical modules. Certainly we must postulate operations between semantic and syntactic structure, or syntactic and phonetic structure, or morphological and phonological structure. These 'interfaces', however, are not derivational devices in the sense of (5) since they are operations between modules and thus between different constructs. The DD proper is a derivation between two levels of the same construct within the same module. With this point

clarified, we may dismiss the LFG algorithms for deriving f-structures from c-structures as an interface and not a derivational device.

4.3.4 Image-schemas

To conclude this section, I would like to digress briefly to consider one additional grammatical theory which does not figure in the four Studies of this thesis but which conclusively illustrates that derivational devices are not restricted to the transformations, whether hidden or open, of generative grammatical theories. Cognitive Grammar (Langacker 1986) is presented neither as a generative theory nor a transformational one by any means. This theory has rejected the concept of an autonomous module of syntax in favor of one single module combining lexicon, syntax, and semantics. It has abandoned the familiar machinery of phrase structure rules, tree diagrams, and syntactic features for the cognitive-based constructs of *image-schemas*. These image-schemas are in essence spatially-based interpretations of meanings where one element, the *trajector*, figures in relation to another, the *landmark*, and both are usually shown in relation to a temporal axis. Often the trajector can be equated with the syntactic subject and the landmark with the syntactic object. A very simple example of an image-schema is given in Figure 7.

Even such a radical departure from generative grammatical theory as is represented by Cognitive Grammar has need of a derivational device. In this theory, oddly enough, there are no qualms about calling the device a transformation. A transformation in Cognitive Grammar can, for example, alter the focus within the basic image-schema. It can focus the trajector (actor) in the image-schema opposite instead of the time axis to form a noun ('climber') from a verb ('climb'). This transformation is thus equivalent to a lexical word-formation rule in LFG. The ability to change focus makes passive also amenable to a transformational derivation in Cognitive Grammar. One intuitive and undisputed characterization of the passive is precisely that the perspective is different from the active: in the terms of Cognitive Grammar, the landmark would be promoted to the focus position in place of the usual focus on the trajector. Still a third example of a transformation in this theory is the extension of a basic image-schema into the domain of metaphor. In this type of transformation, the image-schema is kept intact but placed, so to speak, in another 'dimension'. This new dimension colors the meaning of the image-schema while keeping the

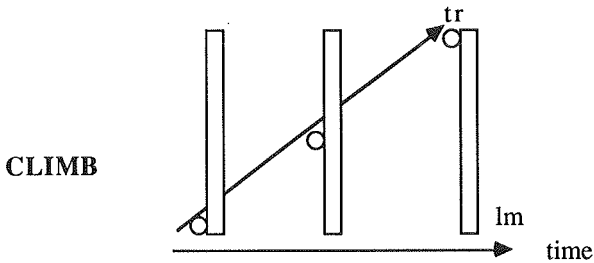


Figure 7. Cognitive Grammar image-schema for the verb 'climb'.

original meaning intact. For example, metaphors often consist of speaking of inanimate objects in human terms or vice versa, as in this statement:

(9) Food prices keep *climbing* every month, while wages are *sitting* still.

The point I wish to make is that in each of the transformational examples above we find an image-schema being converted into a new image-schema. With these last very radical examples, I hope to have illustrated beyond a doubt the reality of the derivational device as defined here and its central role in modern grammatical theory.

4.4 Principles and restrictions

It is essential that any grammatical theory include some means of restricting the rules of the grammar so as to produce only grammatically acceptable sentences. This has always been one of the basic criteria which must be fulfilled by a generative grammar, and the best way to meet this stipulation is by postulating general principles or restrictions which can apply to a wide range of phenomena or a wide range of constructions. Specific rules for rejecting ungrammatical strings of a specific nature are to be avoided because they 'cost' the grammar too much. Stated very simply, the idea is to get the most work out of the least amount of rules.

Since GB, GPSG, and LFG are all generative grammars, they must all assume some basic principles in order to restrict the generation of syntactic structures appropriately. Often it is possible to derive the same effect of a principle in one theory from a completely different set of restrictions assumed in another theory. Many such correspondences have already been noted and discussed by other writers (Sells 1985, Wasow 1985, McCloskey

1988, Engdahl 1988). I will discuss several such correspondences in the context of the Studies of this thesis.

4.4.1 Explaining word order

One of the most fundamental challenges facing any grammar is that of accounting for observed word order patterns. It is also a very difficult challenge, since word order can vary considerably both among languages and often within one and the same language ('free word order languages'). Nevertheless, word order variation is one aspect of language for which GB, GPSG, and LFG have managed to develop general principled accounts. The approach in all three theories has been basically the same: two sets of rules, one unordered and specifying content only, and another imposing order on this content, are allowed to work in conjunction to produce the desired word order effects.

This system of cooperation between unordered rules and general ordering principles is best illustrated in GPSG's use of the ID-LP format introduced in section 2.3 and exemplified again here with an example of two rules from the GKPS grammar for English.

- (10) ID: VP \rightarrow H[2], NP
 LP: SUBCAT < -SUBCAT

The ID rules specify the categorial content of one local phrasal projection at a time, and the LP rules order this content. The number [2] in the ID rule above is the value of the SUBCAT feature of the head. Given the LP rule requiring that items bearing the SUBCAT feature be ordered before those lacking it, this ID rule will produce a head-initial VP. LP rules are usually very few in number¹⁰ and these generalize in application over the whole set of ID rules. They are language-specific in their formulation, and this allows them to capture the wide range of variation in word order patterns among different languages. LP rules are also versatile enough to allow for describing variations within one language, since they can in theory refer to any syntactic feature which might be a factor in deciding word order. This property is exploited in Study II for the intricacies of alternative word orders allowed with Swedish adverbs. Free word order languages might be said to lack LP rules, so all ordering possibilities arising from the projection of the ID rules will be tolerated. GPSG also assumes a more universal ordering property governing the language-specific LP rules. This

is the Exhaustive Constant Partial Ordering (ECPO) property, whereby all the expansions of one category follow a partial ordering sequence which is also followed in the expansions of all other categories (GKPS, p.49). The ECPO property is argued to be an essential property of all natural languages. Study II gives a more complete picture of how the intricacies of word order may be handled in a GPSG grammar.

Roughly speaking, GB also uses something like an ID-LP format to restrict word order, although its version of LP rules are not the simple statements of GPSG but a system of universal parameters associated with different, language-specific values. The X-bar schema of GB is the equivalent of GPSG's ID rules in that it specifies the content of categorial projections but not the ordering of this content. The positions of the specifier, head, and complement in the X-bar schema depend upon the values of at least three parameters: head (initial or final), case assignment (left or right), and theta role assignment (left or right). The head parameter corresponds directly to the LP rule quoted above, since the lexical head of a projection is in GPSG the one carrying the feature [SUBCAT]. Normally, the head and case assignment parameters will match. That is, if the head parameter is set at initial, then the case parameter will be set at assignment rightward, and the language will be of the SVO or VSO type. Head final and leftward case assignment will characterize SOV. Case is assumed to be assigned in surface structure, so the case parameter reflects the expected surface word order. But since GB assumes two ordered levels of constituent structure, its word order principles must be designed to generate not only the surface structure but also the underlying structure. The theta role assignment parameter is responsible for ordering D-structure properly, theta roles being assigned in D-structure. Theta role assignment normally matches the direction of case assignment, but this may not always be true. As argued in Koopman (1984), a mismatch in these parameters may help to make a simpler account for the word order facts of languages like Chinese and Mahou. Such a mismatch universally forms the basis for some of the most familiar instances of mismatch between D-structure and S-structure in GB analyses: passive and raising constructions. As noted earlier, this system of directional parameters is not exactly suited to capturing the word order facts about free word order languages. One might suggest leaving the parameters unspecified in such languages, but this argues against the assumption that the parameters are universally significant, and I know of no existing analysis incorporating such a suggestion.

Notice that the case and theta directional parameters of GB are in essence a means of encoding the grammatical functions of subject and object into the D-structure and S-structure configurations, since it is these arguments which are directly affected by theta role and case assignment. The encoding is an indirect one: the grammatical functions are only recognized by their position in the D-structure configuration. In contrast, LFG's approach to word order allows the grammatical functions SUBJ and OBJ to influence word order directly. The lexical rules of LFG act as the content rules of the theory, specifying which arguments are to be included in a construction. A set of rules called Partial Syntactic Encoding then specifies how the arguments are to be associated with the categorial projections created in the c-structure (for configurational languages) or with morphological case features (for non-configurational languages). The syntactic encodings are language-specific, while the set of grammatical functions is universal. This direct syntactic encoding wipes out any of the kind of movement effects entailed in the GB scenarios involving mismatch of theta and case parameters (Bresnan 1982).

4.4.2 Regulating argument structure

Well-formedness depends upon content as well as order: the grammar must be restricted from generating unacceptable sentences like the following:

(11) *The girl handed.

There must, in short, be a way to regulate argument structure so that there are never any 'missing' or 'extra' arguments generated.

LFG can achieve this easily with two complementary well-formedness conditions referring directly to the grammatical function primitives of the theory. The *Completeness Condition* ensures that f-structures contain all the necessary arguments, while the *Coherence Condition* ensures that every realized argument is actually governed and thus allowed by some predicate in the f-structure.¹¹

Since GB does not refer directly to the grammatical functions as primitives, it can only achieve a similar result by defining principles governing the behavior of a roughly corresponding construct: theta roles. GB's version of completeness and coherence is embodied in the *Theta Criterion* (Sells 1985). The Theta Criterion stipulates that only one thematic role (agent, patient, beneficiary, etc.) may be associated with each argument

position which is eventually realized in the syntax (= coherence). In addition, each theta role appearing in the lexical subcategorization of a word must be realized as a syntactic argument (= completeness).

The situation in GB is a bit more complicated, however, due to the need to impose well-formedness conditions on both D-structure and S-structure. The Theta Criterion is therefore supplemented by the *Projection Principle*, which requires that argument structure remain intact at all levels of syntactic analysis. The Projection Principle has two important consequences for the grammar: It bars transformations from introducing new arguments into a structure, and it forces the grammar to postulate empty argument positions in D-structure (so-called non-thematic positions) to act as slots for moving arguments around by means of transformations. However, empty argument positions might also seem to be generated even in the absence of transformations. Notice that example (11) admittedly gives a simplified view of the facts about argument structure. Typologically speaking, we can often identify apparent omissions of arguments in many languages, including English. The omitted argument can be identified from context, as in the following:

- (12) a. The girls at the office were busy stuffing envelopes.
 b. Lisa stuffed \emptyset , Sharyn licked \emptyset , and Kim stacked \emptyset .

The \emptyset argument is treated by GB not as a missing argument but as a normal argument position filled by the abstract feature *pro*. Apparent omissions like the ones in (12) complicate the data on argument structure, but they also provide support for the use of abstract features like *pro*. Without *pro*, the lexicon would have to be complicated by the listing of two separate entries for each of the verbs in (12). With it, each verb requires only one entry, and the Projection Principle can be upheld just as well by the presence of an abstract argument as an overt one.¹²

GPSG does not refer to either grammatical functions or thematic roles and rejects both the GB and LFG methods of defining the subject and object arguments. For GPSG, grammatical functions are neither grammatical primitives nor configurationally defined. Instead, they are defined as semantically interpretable, following Dowty (1982) (GKPS, p. 195). The grammatical function arguments are seen as semantic terms which are defined by the order in which they combine with verbal expressions: indirect object first, direct object next, and subject last. But as noted earlier,


GPSG does not use semantic interpretation as a post-syntactic filter to reject ungrammatical sentences. Argument structure will thus already have to be satisfied directly in the phrase structure rules. This is accomplished without any special stipulations on argument structure corresponding to the Theta Criterion or the Completeness and Coherence Conditions. Instead, argument requirements are encoded simply as a [SUBCAT] feature, and this feature is referred to by the ID rules. This makes it impossible, for example, to insert a verb subcategorized as intransitive into an ID rule bearing the [SUBCAT] feature of a transitive verb. Non-thematic arguments in GPSG are also specified by subcategorization with the use of the features [NFORM *it*] or [NFORM *there*]. In the GKPS English grammar fragment, the subcategorization for the verb *is* optionally allows for agreement with a subject NP specified as [NFORM *there*], making possible an example like 'There is a stranger in the garden.'

4.4.3 Restricting dependency relations

In the previous section it was shown that the argument structure of a sentence is dependent upon the lexical properties of the verb. This is only one instance of the more general phenomenon of dependency in language. Other instances of dependency relations involve antecedent-anaphor relations, morphological congruence, resumptive pronoun strategies, and the kinds of long-distance dependencies identified with questions, relative clauses, and topicalizations. We have already seen that congruence can be handled in one way by a semantically-based principle like GPSG's Control Agreement Principle (section 4.3.2). The assignment of antecedents to personal pronouns are attributed by GB to the strictly syntactic principles of Binding Theory: binding of pronouns and reflexives is defined in terms of the local constituent relation of c-command as defined in 2.1. This section will focus, however, on the nature of long-distance or unbounded dependencies and will examine the principles proposed by GB, LFG, and GPSG for predicting their acceptability. This is an interesting topic because it is one area in which the three theories have reached a virtual consensus, both in their analysis of the nature of the construction and of the restrictions upon it. This has been noted and commented upon by both Wasow (1985) and McCloskey (1988). Their remarks, however, refer mainly to GB and GPSG. The following is based on their observations and extended to LFG as well.

The typical long-distance dependency can be illustrated by a wh-question such as the following:

(13) Which boy did she say that she had seen _ ?



As shown earlier in 4.3.3, LFG uses a special phrase structure rule schema to produce such a construction, while GPSG uses all the grammatical machinery of a metarule, a Feature Cooccurrence Restriction, the Foot Feature Principle, and an ID-rule. As may be expected, GB uses the transformation Move alpha. In other words, this is one construction which requires the use of a derivational device, regardless of the theoretical framework. Furthermore, the construction is assumed in all three frameworks to be made up of a series of smaller 'links' in structure which together give the illusion of unboundedness (McCloskey 1988). This is indicated by the arrows in (13) above. The linking forms a path or chain through the structure from one point (the 'tail' in GB or 'bottom' in LFG) to another point (the 'head' or 'top'). Whether this linking is to an empty category in constituent structure (as in GB and GPSG) or to a grammatical function (as in LFG), it must obey some restrictions in order to account for ungrammatical sentences such as the following:

(14) *How valuable did you own a necklace that was _ ?

These restrictions have taken different points of reference at different times during the development of the three generative theories we are discussing.

The earliest approach used in transformational generative grammar was to define restrictions, known as Island Constraints, according to the nature of the lower end of the dependency (Ross 1967). For example, (14) was said to be unacceptable because of a Complex-NP-Constraint, which forbid long-distance dependencies from originating in a complex noun phrase. No restrictions were placed upon the character of the tail itself but upon the nature of the phrase immediately containing it. A more recent approach focusing on the actual tail of the dependency itself is incorporated into the latest LFG account of long-distance dependencies, where island constraints are expressed as language-specific constraining equations specifying what grammatical function the bottom of a dependency may be. The rule for English thus restricts the bottom of the dependency to being any

grammatical function other than a clausal complement, i.e. GF -COMP (Kaplan and Zaenen 1989):

$$(15) (\uparrow \text{ TOPIC }) = (\uparrow \{ \text{COMP, XCOMP} \}^* (\text{GF -COMP})).$$

This approach was later refined by the insight that long-distance dependencies could emanate only from lexically governed categories. This is the guiding insight behind both GB's Empty Category Principle (ECP) and GPSG's Lexical Head Constraint (Wasow 1985). The Lexical Head Constraint states that metarules may only operate upon lexical ID rules (GKPS p. 59). Long-distance dependencies are formed in GPSG by using a metarule to introduce the [NULL] feature (4.3.3 above) and a Feature Cooccurrence Restriction to force [SLASH] to appear as well. The Lexical Head Constraint then in effect restricts [NULL] from appearing in any non-lexical (and hence non-governed) phrase structure configuration. GB's ECP (Chomsky 1981) states this restriction directly in terms of constituent structure and government as it is defined in 2.1. The ECP is somewhat more liberal than the Lexical Head Constraint, however, because it recognizes two kinds of government as valid. A trace left by syntactic movement is legal if governed either by a lexical category or by its antecedent (i.e. the moved constituent forming the head of the dependency). Thus the ECP considers not only the tail of the dependency but also possibly its relation with the head. This might be considered a second approach to restricting the construction by focusing on the head as well as the tail.

A third alternative is to base restrictions upon the nature of the intervening material between the two ends of the dependency. Since the construction is conceived of as a series of links, there may be conditions under which links are broken or blocked. This is the metaphor upon which GB's conceptions of subjacency, barriers, and blocking categories are based. All are attempts to draft general principles describing the structural conditions which may block the path of a long-distance dependency. They are in a way an extension of Ross' original Island Constraints in that they consider not only the lowest, immediate link in the dependency chain but all the links. Furthermore, a blockage of the path is now not simply a matter of categorial status (as in Ross' constraints) but depends instead on a complex array of variable factors.¹³ GPSG's Feature Instantiation Principles may fall under this approach also. Since in GPSG only one local tree can be dealt with at a time, it is crucial that the [SLASH] feature pass unhindered from

one tree to the next in order to establish the necessary links to uphold the dependency. The Head Feature Convention and Foot Feature Principle both control the instantiation of [SLASH], with the result that island constraints are correctly observed (McCloskey 1988, GKPS p. 165). LFG's latest analysis of long-distance dependencies also provides for restricting the nature of the intervening material or 'body' as it is called in Kaplan and Zaenen (1989). Their rule quoted in (15) above accounts for island constraints in English by barring dependencies from crossing a path consisting of anything other than either closed (COMP) and open (XCOMP) complements.

Thus it may be said that all three theories have tried to describe the behavior of long-distance dependencies by using general principles. The principles themselves are different, but the underlying approach they embody is the same in that they all treat such dependencies as series of links with a beginning, a middle, and an end. All three portions of the dependency must conform to the appropriate conditions if the entire structure is to be accepted. Whether these conditions are expressed in terms of syntactic government, feature instantiation, or grammatical functions, the result must be an unbroken path from one end of the dependency to the other. On this point GB, LFG, and GPSG are clearly in agreement.

4.5 Goal of the research program

The goal of a theory's research program can in essence be stated as a matter of perspective: whether the research program is very data-oriented or theory-oriented. By this is meant whether the theory is made to serve the purpose of accommodating data in a satisfying way, or whether it is the theory which is made to grow under the influence of research on new sets of data.

GPSG, at least in its current form, represents the former orientation. In its conception, it may have truly been concerned with developing an alternative theory to the transformationally-obsessed predecessors of GB. But as it is used today in much work, GPSG has the character of providing a way of writing very specific rules for generating a wide variety of syntactic constructions. By exploiting syntactic features to the fullest, the researcher is able to draw up a grammar that will fit the data without having to ignore too many troublesome exceptions. The result is a fully working descriptive grammar, like the one arrived at in Study II, and very often this grammar is one that might be suitable for machine

implementation. GPSG or GPSG-related grammars are thus often used as the basis for work in computational linguistics. Examples of such work may be found in Sigurd (1987) and the Grammar Development Environment developed at Edinburgh and Cambridge Universities (Boguraev et al 1988).

LFG is also a theory that is largely data-oriented. Its ability to accommodate the facts of a wide variety of languages often not amenable to analysis under the more rigid GB terms is one of the arguments proponents of the theory tend to cite. It is not surprising, then, that there are LFG-based analyses for languages which might otherwise be neglected by the more configurationally-concerned GB or GPSG: Malayalam (Mohanam 1982), Vietnamese (Rosén 1988), Chichewa (Bresnan 1990), Mandarin (Huang 1990) and our own Icelandic Study I. In fact, the ability of LFG to accommodate a wide variety of word order configurations by reference to the functional concepts of SUBJECT and OBJECT is one of the basic arguments in favor of the theory. Since MRGR, LFG has also figured in the computational linguistic literature and has been used in implementations such as The Stuttgart LFG System.

GB stands in sharp contrast to these two theories. GB may be said to be almost totally theory-oriented. This is made explicit in the research program set out for its proponents in LGB: The objective is to discover as much as possible about the nature of the universal grammatical principles inherent in mankind, and this is to be done by examining as much data as possible from as many different languages as possible and attempting to draw typological parallels. Data is thus seen as a means to discovering the best formulation of the theory and specifically of the principles and parameters it assumes. Syntactic studies written within the GB framework are thus not primarily concerned with developing working analyses for specific grammatical constructions in specific languages. To be sure, such working analyses are necessary if any kind of hypothesis is to be advanced and argued for. But the true object of any GB investigation is most often one of the theory's central principles and how it may be applied with respect to a set of empirical data. The researcher's goal is to use this data to argue for or against the current formulation of the principle in question, perhaps suggest what might be a better formulation, and thereby hopefully improve the theory's formulation on the whole. With this in mind, it is easy to understand why GB is the syntactic theory which experiences the highest rate of 'turnover'. The necessity for change is built into the research program. Unless this theory orientation gives way to a more data-oriented

research, or unless the majority of syntacticians convert to another framework, this trend should continue.

4.6 Summary

The observations of the previous sections are summarized in Table 1.

Table 1. Summary of cross-theoretical observations.

	GB	GPSG	LFG
<i>graphic representation:</i>	tree	tree	tree
<i>constituent structure theory:</i>	X-bar	X-bar	X-bar
<i>clause head:</i>	INFL	V	exocentric
<i>descriptive annotation:</i>	syntactic features	syntactic features	syntactic features
<i>basic-level construct:</i>	X-bar constituents	enriched syntactic categories	lexical entry
<i>derivational device:</i>	transformation Move alpha	metarule, feature instantiation	lexical rule
<i>word order mechanism:</i>	parameters, case theory, theta theory	ID/LP rules	Partial Syntactic Encoding
<i>argument structure:</i>	Theta Criterion	SUBCAT feature	Coherence Completeness
<i>control of long-distance dependency:</i>	ECP	Lexical Head Constraint	functional control

5.0 CONCLUSIONS

5.1 Characteristics of the modern syntactic theory

As the previous discussion has hopefully shown, there is a great deal of covert agreement among the three dominant syntactic theories today. Distilling these observations to the highest level of generality and metatheoretical abstraction, it may be concluded that any modern syntactic theory will necessarily display the following general characteristics:

- The syntactic component will be divided up into a system of subcomponents.
- There will be some means of classifying syntactic elements into a system of categories.
- There will be at least one and possibly several constructs which the theory uses as its basic 'building block': for example, the syntactic tree diagram, the phrase structure rule, or the lexical entry.
- There will be some type of derivational device which interacts with the primitive construct of the theory and somehow enhances the information carried in this construct.
- There will be general well-formedness conditions expressed as principles, criteria, or restrictions which act to filter out ungrammatical structures.
- There will be some concept of how two elements in a structure may and often must enter into a special dependency relationship with each other: for example, agreement, casemarking (i.e. government), and the distribution of empty categories or their equivalents.
- There will be a careful specification of the goals and assumptions of the theory in order to distinguish it from the previous ones and justify it as more than just an alternative notation.

Note that this list does not include assumptions about phonology or semantics. These are marginally present to various degrees in the three theories studied here. Syntax is the only essential component, even though semantics may be given some measure of influence upon it.

We may then conclude that the major areas of recognized disagreement among the contemporary syntactic theories are rooted in differences of specific ideological goals (theory vs. data or psychological reality vs. observational precision), levels of analysis (configurational vs. abstract

functional information), and specific definitions and choices of theoretical primitives such as syntactic features, grammatical functions, and derivational devices. These areas of disagreement are more than enough to make one theory seem superior to another when it comes to the everyday practical application of each theory to the analysis of natural language phenomena, as the four Studies of this thesis demonstrate. No single one of them, however, can be said to be best at handling all the necessary aspects of syntactic analysis.

5.2 Choosing among competing theories

Upon what, then, does the syntactic researcher base his choice of theory? One very practical view of the matter may be found in Engdahl (1988): 'Which type of theory you choose to work in presumably depends to a large extent on what your purpose is.' This view is supported by the four Studies of this thesis. When the emphasis is on case and grammatical functions in Study I, LFG is the natural choice to do the job. The analysis of passives is one of the cornerstones of LFG theory and can be exploited nicely for Icelandic. The diachronic interest in Study I furthermore makes a lexically-centered theory a very attractive one to work with, since it is easy to postulate an ongoing change of the casemarking specifications in the lexical entries of a certain class of Icelandic verbs. In Study II, it is GPSG which serves admirably as the basis for drafting a descriptively accurate and detailed grammar for a fragment of Swedish which illustrates how the verb-second phenomenon appears in that language. Note that the conclusion of Study II, however, is that the GPSG grammar is not totally satisfactory if the purpose of the study is to develop an explanatorily adequate account instead. If that is the case, then the configurationally-oriented GB theory with its principles and parameters approach offers more to work with. Similarly, the purpose of Studies III and IV is not to develop a precise and detailed descriptive account of Irish syntax. These studies are properly viewed as 'exercises in abstraction':¹⁴ Given the GB principles and parameters approach and the abstract functional categories recently postulated by the theory, Studies III and IV follow the implications to their natural conclusion in order to discover how well they may predict and be said to explain the facts of Irish syntax when seen in typological comparison with other languages. LFG and GPSG do not lend themselves as readily to this kind of abstract typological study because of their more language-specific and data-oriented perspectives in research.

The success of each theory can therefore only be judged on criteria other than how well specific syntactic phenomena can be accounted for. This is not to say that the evaluative criteria examined earlier and including such things as explanatory adequacy, coverage, simplicity, and implementation are uninteresting. The point is that these criteria are meaningful only when applied in context, where by context is meant the purpose of the individual researcher or the goals of the individual theory. In other words, evaluation can only be relative. The overall success of a grammatical theory can only be judged internally — as a measure of how well a theory has managed to uphold its assumptions and attain its own particular set of self-imposed goals. The real question, however, then becomes whether the internal goals of the theory happen to be the ones which the community of linguistic researchers on the whole (or which the prevailing majority of this community) happen to also support at the moment. This seems to be the essence of what makes one theory appear to be more successful over another or more ‘right’ on the whole at any one time in history — not how much better it may be in relation to any competing theory.

5.3 The modern syntactic paradigm

How does one syntactic theory win the majority of supporters in the scientific community? Thomas Kuhn (1970) has given the philosophy of science one theory of how scientific paradigms come and go, and his ideas have also been applied to the history of linguistic science. In Kuhnian terms, *normal science* is conducted within the confines of a dominant *paradigm* which all researchers accept. If the paradigm encounters a problem which it cannot solve, an *anomaly*, then competing theories will come to challenge it, and a period of *extraordinary science* will ensue. Normal science is restored again when one of the competing theories is recognized as revolutionary and gains the majority of support of researchers. The old paradigm and the new one are according to Kuhn incompatible.

Many writers — linguists, historians, and philosophers included — have speculated about whether Chomsky's transformational grammar as first presented in *Syntactic Structures* represents a scientific revolution and the establishment of a Kuhnian type paradigm in linguistics. While many felt earlier that it did (Searle 1972, Newmeyer 1980), more recent opinions are doubtful (Newmeyer 1986, Emons 1988). The main objection seems to be that transformational grammar has not won the support of the majority of linguists by any means, if we consider non-transformational alternative

theoretical frameworks such as GPSG and LFG to be incompatible competitors for the paradigm title. Newmeyer (1986) does argue, however, that although transformational grammar may not represent a truly Kuhnian revolution, it should be regarded as revolutionizing linguistic theory by introducing a new concept of the very nature of syntactic theory. He even mentions GPSG as an example of a non-transformational theory which is nevertheless Chomskyan in its views. Another very important point made by Newmeyer is that while all linguists may not accept transformational generative grammar, they cannot ignore it. So although generative grammar may not dominate linguistic science bureaucratically or statistically, it does in spirit.

After conducting the four Studies of this thesis and discovering many parallels among the three supposed theoretical competitors, my own conclusion is that we do find ourselves in a period of normal science under the auspices of a generative syntactic paradigm. The reigning syntactic theory of this period is the generative grammar as characterized in its fundamental form above, and it is the uniting force behind the three separate incarnations found in GPSG, GB, and LFG. These three frameworks are not totally incompatible competitors. Despite their separate views on the details and goals of grammatical analysis, all three theories are agreed upon the essential ontological basis for a syntactic theory, and their continued debate and interaction regarding the particulars will presumably and hopefully advance our overall understanding of syntax as much as it has already done. All three theories are needed in order for research to continue, since the field of syntax is a multi-faceted one with many different kinds of problems still to be solved. Grammars and grammatical theories are tools for working with languages, and linguists still need a wide range of tools from which to choose.

To illustrate this, I would like to point out a concrete example of an area in which the three prevailing syntactic theories have literally come together to enrich one another and serve as generative tools in the truest sense of the word. When the researcher is faced with doing strictly syntactic analysis and need not consider questions of ideology, language acquisition, psychological reality, etc., the best solution may be to simply take the most useful aspects of each theory and combine them somehow. This is the situation in which the computational linguist working with natural language processing finds himself. This researcher's goal is to devise an efficient and accurate system for parsing and generating natural language, and

consideration of qualities such as psychological reality may only be of marginal interest to the task. In such a system, then, LFG grammatical function primitives may suddenly be quite at home beside GPSG type phrase structure rules. The Referent Grammar (RG) formalism used in the SWETRA natural language processing system at Lund University (Sigurd 1987, Dooley Collberg 1988) is an example of exactly this type of hybrid grammatical analysis.

Similarly, cross-fertilization of theories can be seen even on the strictly theoretical level. For example, GB now accepts that casemarking can be controlled lexically for languages like Irish and Icelandic (Stowell 1989), thus combining the most applicable aspects of GB and LFG as discussed in Study I. The future could hold further such compromises, if the three generative theories pay more attention to their common ancestry and underlying compatibility. This thesis may serve as a reminder of these common bonds and a spur to such cooperative and 'regenerative' efforts.

NOTES

- ¹ Hale (1983) and Woolford (1986) are exceptions.
- ² See GKPS, chapter 1, note 6 for a list of these works.
- ³ Adapted from Sells (1985) with slight modification.
- ⁴ For recent contributions to this ongoing debate, see Shieber (1985), Pullum (1984), and Gazdar (1988).
- ⁵ For recent examples directly related to the four Studies of this thesis, see Guilfoyle (1990) and Platzack (1990).
- ⁶ See for instance Taraldsen (1982).
- ⁷ About 30 different syntactic features are listed in GKPS, with provision for additions.
- ⁸ I am indebted to Elisabet Engdahl for making me aware of this second type of DD found in GPSG.
- ⁹ But see Kaplan and Zaenen (1989), where that view is revised and functional relations are argued to provide a better means of expressing island constraints on long-distance dependencies in English and Icelandic.
- ¹⁰ The GKPS grammar for English requires only three.
- ¹¹ A third well-formedness condition, the *Consistency Condition* (also known as the *Uniqueness Condition*) requires that every attribute in an f-structure have only one unique value. This is mainly to ensure that the f-structure is a mathematical function and that the properties of lexical items which are grammatically dependent upon one another will be compatible. Thus the Consistency Condition is chiefly concerned with enforcing what kind of arguments are required (as in agreement relations, for example) rather than controlling their presence or absence.

- ¹² There are, of course, conditions upon the identification of the abstract *pro*. If *pro* is unable to find a valid antecedent, then an overt argument will be obligatory.
- ¹³ Study IV, for example, assumes that it is the language-specific nature of Agr which determines whether VP is a barrier in Irish, Icelandic, and Swedish.
- ¹⁴ It was Elisabet Engdahl who suggested that they be regarded and conducted as such.

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Oblique Subjects in Icelandic Passive Constructions*

Sheila Dooley Collberg

The problem which I will examine in this paper concerns some peculiarities of casemarking in Icelandic passive constructions. These peculiarities pose problems for a transformational account of passivization and casemarking, but have been argued by Andrews (1982) and Zaenen, Maling, and Thráinsson (1984) to be consequent with a lexical-functional account. I will first review these synchronic descriptions of the phenomena and then proceed to look at them from a diachronic point of view. In making this diachronic examination I will draw upon the Transparency Principle and the diachronic theories of change discussed in Lightfoot (1979).

According to the Transparency Principle, languages undergo changes in order to remedy any inconsistencies in the grammar which can no longer be tolerated. Lightfoot reviews several examples of such inconsistencies. Typically they involve situations in which it is possible for speakers to analyze one grammatical construction in two different ways. This was the case, for example, with impersonal verb constructions in Middle English.¹ In Middle English the impersonals could appear without any overt subject NP, but they often took an oblique NP in the normal subject position.

- (1) þam cyngre licodon peran
the king liked pears
DAT-OBJ pl SUBJ

This impersonal construction was productive until case markings were lost and SVO became the fixed word order in English. These two developments made it possible for speakers to analyze the construction in two ways: either as an OVS impersonal still, or as an SVO personal according to the new pattern then appearing in the language. The two competing analyses were both in use for a time, but the Transparency Principle was eventually activated and the impersonal analysis abandoned. Verbs which were

formerly impersonals were reanalyzed in accordance with the SVO syntactic pattern, and the inconsistency was removed.

Such inconsistencies are called opaque contexts and may be present in the grammar for an indefinite length of time before they come to be regarded as intolerable. Unfortunately, it is not possible yet to determine exactly when an opacity becomes intolerable. This is a question which is closely linked to that of what constitutes the limits for a possible, functioning grammar. Until we have found these limits, it will probably not be possible to pinpoint when the Transparency Principle begins effecting a change in a grammar.

It is possible, however, to identify contexts which may eventually require a change or which may already be undergoing one. If the casemarking of Icelandic noun phrases in passive constructions constitutes opacities in the grammar under either of the synchronic accounts mentioned already, then it may be such a candidate for a grammatical reanalysis to remedy the opacity. The inconsistencies of Icelandic casemarking may still be at a level tolerable enough for the coming generation of language learners to accept, but it may already have surpassed the limits of toleration, and the present generation may have already effected a change in their grammar. As evidence for such a change I will look at the occurrence of 'double forms', especially in the utterances of younger speakers. I will also discuss what role casemarking has had in language education in Icelandic schools and in recent studies in language use conducted in Iceland.

1.0 INTRODUCTION TO CASEMARKING IN ICELANDIC

Unlike its other Scandinavian sister languages, Icelandic has retained a four-case system. All noun phrases bear morphological case markings to identify them as either nominative (NOM), genitive (GEN), dative (DAT) or accusative (ACC). Adjective modifiers also bear case markings to show agreement with the nouns they modify. This is true of predicate adjectives as well as attributive ones. Usually the subject of a sentence is marked NOM, the direct object ACC, and the indirect object DAT. The case of a prepositional object is determined both by the governing preposition and by semantic criteria. For example, the preposition *í* 'in' governs a DAT object when it expresses a location and an ACC object when it expresses motion into the object. Sentences (2)-(3) below illustrate the casemarking and agreement phenomena which can be observed in most Icelandic sentences:

plural as in (8) below. Nearly all of them are related semantically in that they describe a mental or bodily state which the oblique subject experiences.

- (6) Hana dreymdi um hafið.
 her dreamed about sea-the
 ACC 3sg ACC
 'She dreamed about the sea.'

- (7) Mér kólnar.
 me is-getting-cold
 DAT 3sg
 'I am getting cold.'

- (8) Verkjanna gaetir ekki.
 pains-the is-noticeable not
 GEN-pl 3sg
 'The pains are not noticeable.'

The impersonal verbs have no passive counterparts because they are for the most part intransitive in nature. Nevertheless, the oblique subject pattern appears in the passive counterparts to a large number of certain personal verbs. As actives, these verbs take a NOM subject like the verbs in (2)-(3). But in contrast to (4)-(5), they allow passivized object nouns to retain their original oblique casemarking even after the nouns have become grammatical subjects. This peculiarity is made even more interesting by the failure of participles to agree with the new subject. When the subject appears in oblique case, the participle consistently takes the third person singular neuter form. The verb itself also fails to agree, taking the third person singular form even when the subject is plural as in (9b):

- (9) a. Eiríkur saknar bræðra sinna.
 Eric misses brothers his
 NOM GEN-pl GEN-pl
 'Eric misses his brothers.'

- b. Bræðranna er saknað.
 brothers-the is missed
 GEN-pl 3sg neut sg
 'The brothers are missed.'

(10) a. Sigga stal bílnum.
 Sigga stole car-the
 NOM DAT
 ‘Sigga stole the car.’

b. Bílnum var stolið.
 car-the was stolen
 DAT-masc 3sg neut-sg
 ‘The car was stolen.’

Agreement phenomena are further complicated by the possibility of NOM objects with which main verbs and passive participles do agree:³

(11) Henni voru sýndir bílarnir.
 her were shown cars-the
 DAT 3pl NOM NOM-masc-pl
 ‘She was shown the cars.’

Such NOM objects are only possible when the subject is oblique.

The two central questions concerning a synchronic account of passivization and casemarking in Icelandic are, therefore:

- i) Why do certain verbs allow nouns to retain their original oblique casemarking after passivization?
- ii) Why is agreement of the participle and verb blocked when the subject is oblique yet realized when the object is NOM?

The next sections will examine how well two differing theories of grammar can be applied to Icelandic data on casemarking and passives to answer these two questions.

2.0 CASEMARKING THEORIES IN GOVERNMENT AND BINDING (GB) AND LEXICAL-FUNCTIONAL GRAMMAR (LFG)

2.1 GB

Characteristic for GB grammatical theory is that different aspects of grammar are regulated by different 'modules' or systems which have particular duties to perform. Casemarking is regulated by one such special system whose duty is to provide each phonetically realized noun phrase with some value for the feature case. The system also includes a case filter which rejects any such noun phrase which for some reason does not receive a case value. This is an indication of how extremely important it is for noun phrases to receive casemarking in GB theory.

The actual assignment of case is a process which may take place at either of two levels and be of two different natures. GB most often regards casemarking as a structural feature which takes place at the level of surface structure. Case assignment proceeds by a set of rules which refer to structural relations in which an NP is 'governed' by another node in the structure. This government relation is the core of the structural case assignment theory and is a central concept in GB. Government relations are restricted to very specific sets of circumstances outlined in Platzack (1982, p. 99-100):

- (12) a. 'governors' must be one of the lexical categories N,V,A,P, or INFL[+fin].
- b. A governor and the NP it governs must both occupy positions within the same maximal projection (i.e. government relations do not hold across the boundaries of maximal projections).

These conditions ensure that it is usually the head word in a phrase which governs its complement. The nature of the governor (N,V,A,P, or INFL[+fin]) determines which case the governed noun will receive.

In addition to structural casemarking, GB also recognizes the possibility of lexical casemarking. Lexical case is also called inherent case and is assigned to nouns at an earlier level than structural case, in the base. Unfortunately, not much attention has been given to working out the details of just how inherent case is assigned. Perhaps it is as simple as a set of

lexical redundancy rules which might look something like this one suggested by Radford (1981, p. 351):

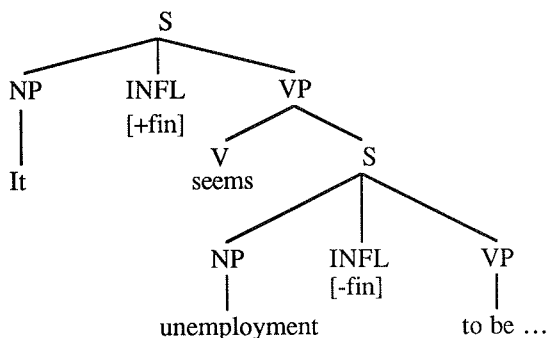
- (13) In any lexical entry where a verb is subcategorized as occurring in a VP of the schematic form (-NP1-NP2) assign NP2 the inherent case feature (OBJECTIVE).

One can also imagine case assignments being directly stated in each subcategorization frame. This might not be so redundant as it seems, as we will see later when we examine evidence from Icelandic.

Not all languages, of course, show evidence of the workings of a casemarking system in the form of morphological case markings. Nevertheless, GB assumes that some version of the casemarking module it envisions is at work in all natural languages. The absence of visible casemarking does not preclude the presence of an abstract case feature on a noun phrase.

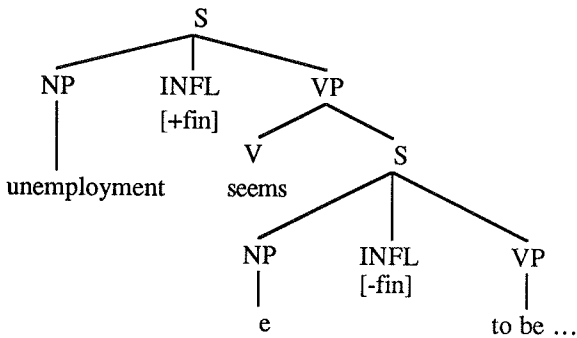
The motivation for assuming the existence of abstract case is based upon how casemarking interacts with the transformations wh-movement and np-movement. The traces left in a structure by these two transformations have the status of noun phrases and thus come under the jurisdiction of the casemarking system and the case filter. Casemarking criteria applied to traces becomes a good indicator of the grammatical acceptability of sentences and can be a way of explaining the non-occurrence of lexical NP in certain positions. For example, casemarking can explain why np-movement is necessary in a sentence with a raising verb like *seem*:

- (14) a. *It seems unemployment to be getting worse.



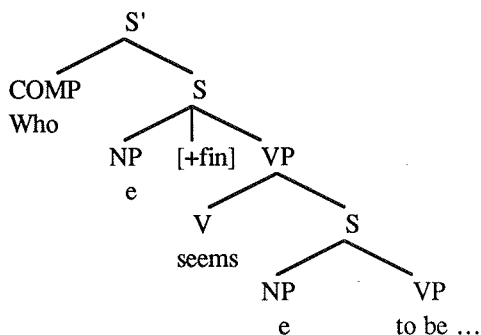
The lexical NP *unemployment* cannot occur as the sister to the verb phrase as it does in (14a). The reason is that only a finite verb can assign case to its subject, and the verb *to be* is an infinitive. Consequently, *unemployment* remains caseless and fails to satisfy the demands of the case filter. But the application of np-movement salvages the sentence by moving *unemployment* to a position where it can receive case in (14b). This is the pattern followed by instances of np-movement. Nouns are moved out of positions where they cannot receive case and into positions where they do. The demand for casemarking upon nouns is therefore supported by the operation of np-movement in sentences like (14b).

(14) b. Unemployment seems e to be getting worse.

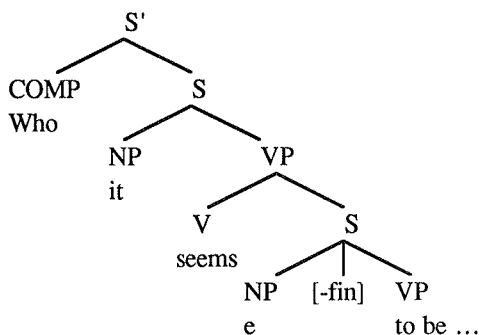


In contrast, wh-traces are as a rule left in positions where they do receive casemarking, while the corresponding wh-phrases are moved to a COMP position in which they cannot possibly be casemarked. Examples (15a) and (15b) illustrate successful and unsuccessful applications of wh-movement. Example (15b) is ungrammatical because neither the wh-trace nor the moved wh-phrase can ever receive case. Sentence (15a) is acceptable, however, because the trace receives case. The wh-phrase is therefore allowed to move as it does and simply 'inherit' case from its trace. The demand for casemarking supports the operation of wh-movement as it did np-movement.

(15) a. Who *e* seems to be proud?



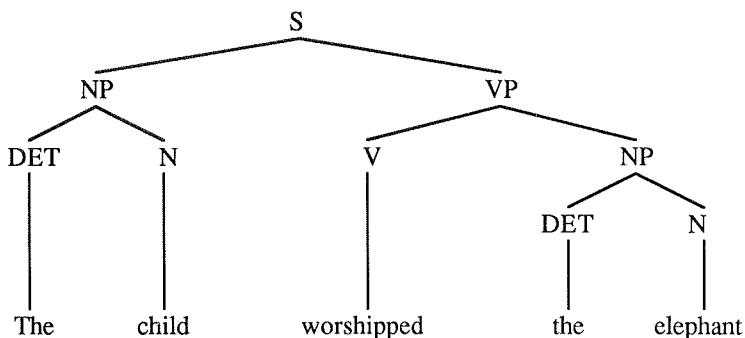
(15) b. *Who *it* seems *e* to be proud?



2.2 LFG

Casemarking does not occupy such a central position in LFG, and case is not regarded as a universal feature appearing on all nouns. LFG's universals are instead theta roles (such as AGENT, THEME, INSTRUMENT, etc.) and grammatical functions (SUBJECT, OBJECT, COMPLEMENT). These two sets of universals get mapped onto one another by means of lexical rules and the result is a representation in two forms: a constituent structure and a functional structure. The functional structure lists grammatical function assignments and is interpreted semantically, while the constituent structure gives the superficial constituent structure and is interpreted phonetically. (16) is an example of an LFG analysis from Bresnan (1982, p. 14) showing this two-part representation.

(16) c-structure:



f- structure:

SUBJ	SPEC	"THE"
	PRED	"CHILD"
TENSE	PAST	
PRED	"WORSHIP((SUBJ)(OBJ))"	
		agent theme
OBJ	SPEC	"THE"
	PRED	"ELEPHANT"

While the grammatical functions SUBJECT, OBJECT, and COMPLEMENT are universals, not all languages have the same method of encoding them. LFG recognizes two main types of encoding: configurational and non-configurational. Configurational languages use surface constituent order to encode grammatical functions. Languages with rigid word order depend upon this type of encoding. Non-configurational languages may have more flexible word order and instead rely upon morphological markers such as casemarkings. Casemarking in LFG therefore has a language-specific role that is linked primarily to the level of constituent structure.

The actual assignment of case, however, takes place in the functional structure and may stem directly from the lexicon. Like GB, LFG allows for the possibility of both structural and inherent case. Structural case assignment is regulated by redundancy rules like the one quoted earlier in (13). These rules refer to the universal grammatical functions and take the form of equations like the following given in Neidle (1982):

- (17) NP
 (OBJ 2)
 (CASE = DAT)

This equation states that any NP bearing the grammatical function of OBJ2 will be marked with the DATIVE case. In this language, then, the DATIVE case will be the normal or 'unmarked' case, and we would expect to find all OBJ2 marked as DATIVE. But perhaps there are instances when OBJ2 may receive a different case. These would be instances of inherent casemarking, where case would be assigned directly from the lexicon and override the structural casemarking equation. Inherent case is therefore a 'marked' or 'irregular' case assignment required by specific lexical items.

3.0 ANALYSIS OF PASSIVE CONSTRUCTIONS IN GB AND LFG

3.1 Case theory, np-movement, and theta roles

In the preceding section it was shown how case theory and np-movement interact in a GB analysis of a raising verb like *seem* (14). GB analyzes passive constructions as involving precisely the same kind of interaction.

- (18) a. np was stolen the car.
 b. The car was stolen.

Example (18) shows a passive construction before and after np-movement. In (18a) the NP *the car* cannot be assigned case because its sister constituent *stolen* is a passive participle and does not qualify as a case-assigning governor. The situation is remedied by applying np-movement to move *the car* out of its caseless position and into the subject position. In (18b) *the car* can be assigned NOM case by the finite verb *was*, and the sentence is acceptable.

A third factor which plays a part in GB analysis of passives is the behavior of thematic roles. Thematic roles or theta roles belong to another one of GB's special modules. Theta roles are assigned in the lexicon in the subcategorization frame of each verb. Listed there are the specifications for the theta roles which should be given to both the verb's NP complements and its subject NP, if it is a verb which gives a theta role to its subject. Some verbs do not, and passive verb forms belong to this group. Like the

predicate argument structure may be associated with only one unique grammatical function. There exists an important difference, however, between GB's Theta Criterion and LFG's condition on function-argument biuniqueness. The biuniqueness condition does not disallow the possibility of alternative grammatical functional assignments to the same predicate argument structure of theta roles. For example, an alternative to the assignment in (19) is possible for the verb *love*:

(20) love (agent, theme)
 BY OBJ SUBJ

This alternative is specifically the one which is valid for *love* used in a passive construction, while the assignment in (19) is the one used in an active construction. LFG regards the change from active to passive, therefore, as a change in functional assignments occurring in the lexicon. The change is effected by the lexical passivization rule given in Bresnan (1982):⁴

(21) V (SUBJ, OBJ) →
 agent theme
 V (BY OBJ, SUBJ)
 agent theme

A comparison of (19) and (20) above shows that this is precisely the change which has occurred. Recall that LFG distinguishes between a functional structure and a constituent structure as illustrated in (16) earlier. The effects of the lexical passivization rule are visible directly in the functional structure where the grammatical function assignments are listed. Since the rule is universally applicable, those same effects will be visible in the functional structure of passives in any natural language. Of course natural languages differ in how they express actives and passives, but these language-specific differences belong strictly in the realm of constituent structure. They are the result of each language's syntactic encoding processes. Configurational languages encode the difference in terms of word order, while morphological languages encode in terms of differing morphology.

Although GB and LFG make use of some of the same concepts, it is clear that the two grammatical theories differ crucially in how they regard the

formation of passives. While GB links the passive directly to movement in the syntactic constituent structure, LFG describes it as a lexical rule creating changes in grammatical function assignments. The depth of the two analyses has important consequences for how successfully they can be applied to data from natural languages. Seen from the LFG perspective, the GB analysis is only adequate for configurational languages. The 'movement' described by np-movement is only an illusion based upon the configurational encoding system used by languages like English. It is a language-specific by-product of a change which can be stated in more universal terms. This is perhaps the most direct and most convincing argument which has been presented by Bresnan (1982) in support of the LFG analysis of passives. By focusing on grammatical functions, LFG's lexical passivization rule is applicable to both configurational and morphological languages. LFG is furthermore able to capture some important grammatical relations which do not always fit into GB's movement-based theory. The oblique subjects found in Icelandic passive constructions are candidates for this category.

4.0 THE EVIDENCE IN ICELANDIC

Now we can examine the Icelandic data again and decide which synchronic grammatical theory, GB or LFG, provides most insight into the problem of oblique subjects. This involves answering several questions about Icelandic, its casemarking system, and the passive construction. Ultimately it involves answering the two central questions posed in section 1.

4.1 Encoding

A question to begin with is whether Icelandic is a configurational or morphological language. This is a valid question because, as was argued in the previous section, GB is most successful in describing the passive in configurational languages. It is also a very interesting question because Icelandic contains evidence for both types of encoding. It is difficult to say to what extent native speakers depend on either, but I would like to suggest that word order has the leading role. This view is based upon the wide variance allowed in the morphological casemarking of subjects and objects, as seen in examples (2) to (11). If case were the sole means of signaling grammatical functions, no such variance would be allowed. Some variation is also allowed in word order (topicalization, inverted order), but it is not comparable to the variation observable in casemarking. Still, casemarking must have some part in the encoding process, since changes in case

morphology can sometimes signal changes in meaning (such as after passivization of regular NOM-ACC personal verbs). So it must be concluded that Icelandic uses a mixture of configurational and morphological encoding processes, and neither GB nor LFG can be favored or ruled out yet on this issue.

4.2 The passive

The next question logically concerns the nature of the passive in Icelandic. Is the Icelandic passive a matter of np-movement (as GB hypothesizes), or a lexical change in grammatical functions (as LFG hypothesizes)? Zaenen, Maling, and Thráinsson (1984) ask precisely this question and conclude that it is the latter. Their conclusion is based mainly upon the argument that oblique subjects (whether they appear in impersonals or passives) are 'true' (i.e. base-generated) subjects rather than topicalized or moved objects. The oblique casemarking should not be taken alone as an indication of an original object status. To prove that oblique subjects are really subjects, Zaenen and Maling run them through several 'tests' for subjecthood. A review of their findings is given in (22):

(22) a. Only subjects can raise:

Ég	tel	konunginum	hafa	verið	gefnar	ambáttir.
I	believe	king-the	have	been	given	slaves
		DAT				NOM

b. Only subjects control obligatory reflexives:

Henni _a	hefur	alltaf	þótt	bróðir	hennar _b	/	sinn _a	leiðinlegur?
her	has	always	thought	brother	hers		boring	
DAT				NOM	NOM	refl	NOM	

c. In topicalizations and direct questions, only the subject appears directly after the finite verb:

Hefur	henni	alltaf	þótt	Ólafur	leiðinlegur?
has	her	always	thought	Olaf	boring
	DAT			NOM	NOM

- d. Extraction is only possible from a clause with the normal subject-verb order:

Ólafur	telur	Jón	að	henni	hafi	alltaf	þótt	e	leiðinlegur.
O.	thinks	J.	that	her	has	always	thought		boring
NOM		NOM		DAT					NOM

'Olaf, John believes that she has always found boring.'

- e. Only subjects (indefinite ones) can be postposed using *það* ('there') insertion:

það	hefur	einhverjum	þótt	Ólafur	leiðinlegur.
there	has	someone	thought	Olaf	boring
		DAT		NOM	NOM

'Someone thought Olaf boring.'

- f. In coordinated clauses, only the subject of the second clause may be deleted under identity with the subject of the first, even if the two subjects bear different casemarkings:

Hann	segist	vera	duglegur,	en	e	finnst	verkefni	of	þungt.
He	says-self	to be	diligent,	but	e	finds	homework	too	hard
NOM						NOM	(DAT)		

- g. Only subjects can be understood as PRO:

Ég	vonast	til	að	PRO	vanta	ekki	peninga
I	hope	for	to	e	lack	not	money
				(ACC)			ACC

Since the oblique subjects behave as true subjects in every test, they should not be analyzed as objects which have undergone movement. This makes LFG the preferred analysis here, describing the passive in Icelandic as a lexically-induced change in grammatical function assignments. The lexical passivization rule for Icelandic can be stated as in (23), following Andrews (1982):⁵

- (23) a. SUBJ → AF DAT / Ø
 OBJ → SUBJ
 OBJ2 → SUBJ, but only if it is a regularly casemarked object
 b. V → Vpart

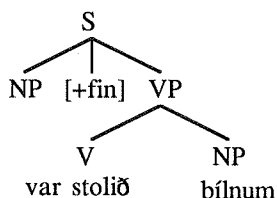
(23a) accounts for the change in function assignments observable in the functional structure. (23b) ensures that the accompanying change in the verb form is also made in the constituent structure.

4.3 Casemarking

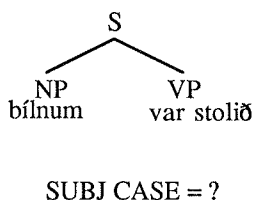
Casemarking is the next point to consider. Is casemarking in Icelandic assigned structurally or lexically? This is a question which is closely related to the previous one concerning the nature of the passive, and it is also one whose answer lends further support to the conclusion that the passive in Icelandic does not involve np-movement.

Both GB and LFG recognize structural and lexical casemarking. To see which type of casemarking occurs in Icelandic, I will examine how the two types interact with the two passive analyses which were just discussed. We will be looking at a total of four alternatives. First, the structural alternatives:

(24) structural, GB:



(25) structural, LFG:



Neither (24) nor (25) can be defended as a correct analysis. The main problem facing both is that subject NPs in Icelandic may bear a variety of casemarkings. In (24) it is possible to identify a [+fin] governor for the subject NP, but it is not possible to state one unique case which the governor will always assign. Here the DAT case happens to be required, but other oblique cases could have also been correct in other instances. The DAT case could not have been structurally assigned by the participle *stolið*, because (as was discussed in section 3.1) participles do not qualify as case-assigning governors. Structural case assignment would have to occur after np-movement, by means of the VP governor, but we have already ruled this out. Similar problems face (25). Once again, it is impossible to designate one unique case value which should be assigned to the NP associated with the SUBJ function.

Given these facts, it seems quite natural to assume that casemarking is inherent or lexically controlled. A lexical casemarking model using an LFG format has been developed for Icelandic by Andrews (1982). A simplified version of the principles used in this model is presented in (26):

- (26) i) NOM is the unmarked case value for NP.
 ii) There are two types of NP in Icelandic:
 ‘direct NP’, which express the simple grammatical functions
 SUBJ or OBJ, and ‘indirect NP’, which express complex
 functions such as SUBJ DAT, OBJ GEN, etc.
 iii) Only direct NP may be assigned NOM case.
 iv) When the subject and object NP in a sentence are both direct, then
 the object NP is assigned ACC case. This is the only instance in
 which a direct NP is given a value other than NOM.⁶

This model does make the correct predictions for the instances we have seen of ‘exceptional’ casemarking (oblique subjects and NOM objects). According to the model, the verbs in examples (2) to (11) have the following grammatical function assignments:⁷

- (27) *taka* (SUBJ, OBJ)
gefa (SUBJ, DAT OBJ1, OBJ2)
dreyma (SUBJ ACC, OBJ)
kólna (SUBJ DAT)
gaeta (SUBJ GEN)
sakna (SUBJ, OBJ GEN)
stela (SUBJ, OBJ DAT)
sýna (SUBJ, DAT OBJ1, OBJ2)

Principles i) and iv) take care of the normal casemarking pattern seen with the personal verbs like *taka* and *gefa*, where subjects are usually NOM and objects are ACC. They also account for the possibility of NOM objects as with *sýna*. When *sýna* is used actively, both the SUBJ and OBJ2 are direct NP and are casemarked according to Principle iv). The SUBJ is NOM and the OBJ2 is ACC. But when *sýna* is used passively, Principle iv) no longer applies. The subject is instead an indirect NP (as in (11), section 1) so the OBJ2 is marked NOM. Principles ii) and iii) set up the system whereby the impersonal verbs like *dreyma*, *kólna*, and *gaeta* are allowed to give the

lexical specifications for the oblique casemarking upon their subjects. Finally, Principle iii) correctly predicts that the indirect (complex) object NP for verbs like *sakna* and *stela* retain their oblique case after the operation of the lexical passivization rule in (23). Principle iii) is motivated by the fact that nouns may only be marked for one unique case value. Compare what happens if the unmarked case value NOM is assigned to both direct and indirect NP after passivization of *taka* and *sakna*:

- | | |
|-------------|------------------------------|
| (28) tekinn | (SUBJ)NOM, (AF DAT) |
| | theme agent |
| saknað | (SUBJ GEN)NOM, (AF DAT) |
| | theme agent |

No conflict arises with the direct NP subject of *taka*, but there is a clear conflict with the indirect NP subject of *sakna*. The distinction between direct and indirect NPs is one that seems justified.

The lexical casemarking model in (26) is consequent with casemarking data in the Icelandic examples we have examined. As a final check to determine whether the LFG lexical model is the one which should be adopted, let us see whether a lexical approach within the GB framework would give the correct results:

- | | |
|--------------------|------------------------------|
| (29) lexical, GB: | stolið, Vpart (NP, NP) |
| | DAT |
| (30) lexical, LFG: | stolið SUBJ DAT, Ø |
| | theme agent |

Example (30) turns out to be the only analysis which is defensible. While the lexical casemarking given in (29) does give the NP the correct case, it also makes np-movement unnecessary. If a passive participle is allowed to assign case lexically, then there should be no reason to move the object NP at all, and GB's np-movement no longer serves the purpose it was claimed to serve in section 2.1: that of satisfying the case filter. We can only conclude, then, that both the passive construction and the assignment of case are in Icelandic lexical.

4.4 Agreement

The last question left to be answered is why main verbs and past participles show no agreement with oblique subjects but do show agreement with NOM objects. It is the most difficult question to answer, and a GB analysis provides a temptingly simple solution. If we were to accept the GB view which describes the oblique subjects as moved objects, then the non-agreement would seem to be a natural consequence.⁸ But everything we have seen thus far supports the opposing view that the oblique subjects are true, base-generated subjects. Besides, there is still the mystery of the agreement with the NOM objects to solve. We must therefore look for another explanation.

The normal process of agreement between NP subjects and finite verbs has been described in Andrews (1982) as a system of defining equations listed in the lexicon. In other words, a first person singular verb form will specifically be restricted to taking a first person singular NP argument as a subject. The number and person specifications upon the NP and verb must match in order for the two to be acceptable as a combination. For verb participles, specifications for gender and case will also be given. The ability of the impersonal verbs and passive participles to take 'mismatched' oblique arguments does not necessarily indicate that the matching system is not the one used in Icelandic.

The non-agreement patterns in Icelandic, like the casemarking patterns, can be described in terms of markedness and unmarkedness. The third person singular form of verbs can be designated as the unmarked form for any finite verb form. The neuter can be designated as the unmarked value for gender upon participles. These designations are not entirely arbitrary, because as Andrews (1982) points out there is considerable morphological and syntactic evidence from other languages that third person singular is the unmarked value for verbs. Specific evidence from Icelandic given by Andrews is that verbs lacking any real arguments (meteorological or seasonal verbs) appear in the third person singular form. The normal subject position for these verbs is occupied by the neuter 'place holder' *það*:

- (31) *það* vetrar snemma.
 it-neut winters-3sg early
 'Winter is coming early.'

Zaenen, Maling, and Thráinsson (1984) show that the non-agreement phenomena in Icelandic can instead be described in terms of agreement: Verb and participle agreement is only with NOM arguments, whether objects or subjects. With this change of perspective, and the normal matching system of agreement outlined above, it is possible to fit the facts of Icelandic agreement into the casemarking model in (26). A fifth principle can be added to the model:

(32) v) Only direct NP carry agreement specifications.

This principle explains why agreement is only with NOM objects and subjects. NOM NPs are always direct NPs. The non-agreement observed in impersonals and passives is not a malfunction of the normal agreement process. Since the indirect (i.e. irregularly casemarked) NP bear no agreement specifications, they are simply allowed as arguments to the unmarked third person singular neuter verb forms. All direct third person singular neuter NPs will also be allowed as arguments to the unmarked forms because their agreement specifications will not match the specifications of any other verb forms. When there is an argument present bearing agreement specifications, the verb will show agreement with it, regardless of its grammatical function. Agreement is thus a very strong tendency in Icelandic, despite the seeming weaknesses observable in the presence of oblique subjects.

In closing this section, it is possible now to answer directly the two central questions which were posed in section 1. The key to the answers has consistently been the lexical nature of casemarking and passivization in Icelandic. The other major factor has been the distinction between two types of NPs in Icelandic representing simple and complex grammatical functions. We can now say that certain Icelandic verbs allow nouns to retain their original oblique casemarking after passivization because that casemarking is lexically assigned and is part of a complex grammatical function. The case assignment in such complex functions remains unaffected by the operation of the lexical passivization rule. Normal agreement of the verb and participle with the subject is blocked when that subject is oblique because oblique subjects express complex grammatical functions. The complex functions carry no agreement specifications and are therefore always arguments to the unmarked verb forms, the third person singular neuter. The normal agreement is realized when the object is NOM because such

objects express simple grammatical functions and do carry agreement specifications.

5.0 A DIACHRONIC LOOK AT OBLIQUE SUBJECTS

Very early in this paper the Transparency Principle was introduced as a mechanism which causes language change whenever grammatical opacities become intolerable. David Lightfoot (1979) has examined several instances of language change and demonstrated how the principle may work. In each instance, the clearest indication that a grammatical opacity exists is the occurrence of 'double forms'. Such double forms are also a sign that the Transparency Principle has begun to effect a change in the language. An existing construction and the corresponding innovation occur side by side for a time until one becomes dominant or is replaced by still another innovation. Often an innovation is created by *abductive change*, a concept adopted by Lightfoot from Andersen (1973). Using the input they hear from their elders, a younger generation of speakers abduces a new grammatical rule and it becomes the norm in their grammar. The grammars between two generations of speakers may in this manner differ on some points. Mutual comprehension is the only restriction upon how they may differ. The change cannot be so drastic as to hinder communication between the two generations. We have already seen in the introduction to this paper how the Transparency Principle worked to transform Middle English impersonal verbs into personals. Now we will see how the principle seems to be causing a very different kind of change in the Icelandic oblique subjects.

5.1 Double forms and *págufallssýki*

Casemarking in Icelandic was presented in section 1 as a fairly regular system. A closer look, however, reveals that native speakers may disagree about what case an NP should appear in. Variations are possible within the same construction. Sometimes these can be semantic variations:

(33) a. Ég fór með henni á bíó.

I went with her-DAT to the movies.

b. Ég fór með hana á bíó.

I went with her-ACC (=took her) to the movies.

(33b) is used to convey the speaker's dominant role in the situation, while (33a) is neutral.

Other variations cannot be attributed to differences in meaning. These are specifically variations in the casemarking of the oblique subjects of impersonal verbs. The impersonal verbs introduced in (6)-(8) lexically assign only one 'correct' case to their subject arguments, but it is admitted that in everyday speech speakers may use a variety of alternate cases. This results in double forms such as the following quoted in Halldórsson (1982):

- (34) a. Mig dreymdi draum.
 I-ACC dreamed a dream.
 b. Mér dreymdi draum.
 DAT

As in (34), the most common variation is by far the substitution of DAT case with verbs which 'correctly' take ACC subjects. The phenomenon is called *méranir* (from the DAT pronoun *mér*) or more commonly *þágufallssýki* ('dative sickness'). Icelandic linguists and teachers have been aware of the tendency for several decades and have discussed it avidly. The general opinion has been that it is an undesirable tendency and should be fought against, but a nation-wide study done by Ásta Svavarsdóttir (1982) shows that the 'campaign' against *þágufallssýki* has not been very successful. The most common school textbooks such as Sigurðsson (1970), Guðfinnsson (1943), and Benediktsson (1981) contain numerous lessons and practice assignments designed to teach students 'correct' case use with oblique subjects. Teachers are said to 'waste' hours of instruction upon preventing the spread of *þágufallssýki*, but this only seems to produce an effect of hypercorrection in certain circumstances. It is clear that the oblique subjects are a troublesome area in Icelandic grammar. Younger speakers are the ones who show the most inconsistencies, and unusual or unfamiliar verbs are, as expected, the ones which cause them the most trouble. From this it may be inferred that children must be actively taught which case each impersonal verb assigns, a view which has been expressed by Jacobsen (1980), according to Svavarsdóttir (1982). This is supported by the fact that academic achievement correlates with the tendency toward *þágufallssýki*: children who do poorly in school have a harder time learning the 'right' case to use.

But it must be pointed out that *þágufallssýki* does not pose any communication problem. Speakers understand double forms like (34). The fact that children must be actively taught casemarking with impersonals cannot mean that they are failing to acquire their native language. What it can mean is that they are acquiring a different rule of grammar from the one their elders have. *Þágufallssýki* is not a sickness, but rather a symptom that the Transparency Principle is at work effecting a change in the grammar of Icelandic. The change is specifically concerned with an opaque context in the oblique subjects — an opacity which the synchronic analysis adopted earlier in this paper has revealed.

5.2 The ambiguous ACC

Recall that in (26) a lexical casemarking model was adopted involving direct and indirect NP. It may have been noticed then that this model contains an ambiguity concerning the ACC case. According to (26), it is possible for ACC to occur both as an indirect NP or a direct NP. In other words, ACC may be assigned either as a default case or a specific lexical case. ACC is the only case which enjoys this privilege. NOM is always a default case, and DAT and GEN are consistently lexical cases. This situation is further complicated by the agreement principle (32) which was added to the casemarking model. It states that only direct NPs carry agreement specifications. If ACC nouns may sometimes be direct NPs, then they too must be allowed to carry agreement specifications just as direct NOM nouns always do. In short, NOM and ACC are not clearly distinguishable from each other. I will refer to this condition as ‘the ACC ambiguity’.

As far as object nouns are concerned, the ACC ambiguity is no problem. It is clear when an ACC object is direct or indirect: the if-then condition given as principle iv) in (26) regulates this. An ACC object is only direct if the subject is a direct NOM. However, the ambiguity does cause problems where subjects are concerned. It may not always be clear when an ACC subject is direct or indirect. This in turn makes it difficult to determine when the subject does or does not carry agreement specifications. Theoretically, an ACC subject might be misconstrued as a NOM subject since the two cases are allowed to share the qualities of being direct and carrying agreement specifications.

The ACC ambiguity is even reflected on the more concrete level of morphology. In nearly all of the strong feminine and neuter noun paradigms the NOM and ACC forms are spelled and pronounced exactly the

same, both singular and plural.⁹ The same is true for some proper names and three of the personal pronouns. Since ACC and NOM nouns share theoretical and morphological likenesses, one may wonder whether language learners may have difficulties in telling them apart. Children do in fact have problems telling the difference between cases: they are taught certain mnemonic tricks to help them (Guðrún Gísladóttir, personal communication).¹⁰

The difference between ACC and NOM is a crucial one for the impersonal verbs. Consider what may occur when a language learner is confronted with a sentence like the following:

(35) *þau vantar mat.*

They-ACC / (NOM) lack-3sg food.

The personal pronoun *þau* is both the third person plural neuter ACC and NOM. The language learner is thus faced with choosing to interpret it as one of these. Whatever choice is made will have consequences for the grammar the learner will acquire. Two alternative grammars might have been arrived at in this instance:

(36) i) *vanta* is an impersonal verb requiring an ACC subject.

ii) *vanta* is a personal verb which takes a NOM subject.

There is evidence that both of these grammars were arrived at by preceding generations. Grammar ii) appears in texts from the 16th Century, where impersonal verbs are used personally. This entails agreement between the NOM subject and the verb. According to Halldórsson (1982), such examples may indicate that Icelandic was then in the process of losing its impersonal verbs, much like the other Scandinavian languages did during the same period. But for some reason grammar ii) was abandoned in favor of grammar i). The impersonal verbs remained in Icelandic, and speakers were able to tolerate the ACC ambiguity. Speakers continued to acquire a grammar in which *vanta* was an impersonal verb requiring an indirect ACC subject.

But we have already seen that speakers no longer acquire such a grammar. They must be taught it. The grammar today's speakers acquire may be said to involve a totally new strategy:

(37) An impersonal verb requires an indirect oblique subject.

This grammar would certainly simplify matters by regarding the impersonals as a distinct class in the grammar. There is already evidence that children do think of them as such a class. Svavarsdóttir (1982) has found that although they show inconsistencies in case use with impersonals, they definitely show no confusion over when a verb is personal or impersonal. Children know that an impersonal requires an oblique subject and that there is no agreement between the subject and the verb. Recall that the matching system of agreement discussed in section 4.4 appeared to be a very strong one. When children are faced with a sentence like (35), an ACC subject may sound like a NOM subject to them and feel 'wrong' in terms of this agreement system. Their reaction could be to substitute a subject that *does* feel like a match — a noun that is unambiguously an indirect NP; one that carries no agreement specifications. The DAT and GEN cases fulfill these requirements. This could account for the phenomenon *págufallssýki*.

There are several reasons why DAT is becoming the natural choice for the subject of impersonal verbs. First, the GEN case is very rare as an oblique subject, and it is already associated with the special function of denoting ownership. It would not be advantageous to give it additional duties which are not related in some way. Second, the DAT case is, unlike the ACC and NOM, a distinctly recognizable form in the majority of the noun and pronoun paradigms.¹¹ The chances of misconstruing the DAT with the NOM are very small. Third, the DAT is already well-established with a number of impersonal verbs as an oblique subject case. The number of verbs which 'correctly' require DAT subjects is a little less than the number requiring ACC subjects, but the group includes some extremely common verbs which are more often an active part of a speaker's working vocabulary. As Svavarsdóttir (1982) points out, verbs which require ACC subjects often have very special meanings and are infrequently used either in oral or written language. Finally, the DAT case is the case which most often occurs as the oblique subject of a passive sentence. The ACC ambiguity does not affect passive constructions because it is not possible to have an ACC subject in a passive construction. As we have seen, only indirect (lexically-assigned) cases are retained after the lexical passivization rule has applied. But a lexically-assigned ACC case can never be passivized because it can only occur in an impersonal construction:¹²

- (38) a. þau vantar mat.
 They lack food.
 SUBJ ACC OBJ ACC
- b. *Mat er vantað.

DAT and GEN are the only cases found as subjects in passives. This pattern seems to be influencing the development in the other construction which allows oblique subjects — the impersonals.

5.3 The future of oblique subjects in Icelandic

It has just been suggested that a new rule is taking form in Icelandic grammar according to which the DAT case is becoming the normal case for oblique subjects, both in passive constructions and in impersonals. This change would not only clear up the ACC ambiguity but also make the entire casemarking system simpler. If DAT were to replace all the ACC subjects, then ACC would be reserved for use with objects alone. Each case would more or less serve a specific function, an ideal situation envisioned by Eiríkur Rögnvaldsson (1983):

- (39) NOM — subjects of personal verbs
 ACC — objects of verbs and prepositions
 DAT — subjects of impersonals and passives
 GEN — objects of nouns

Of course it is not possible to predict whether the trend toward DAT subjects will ever achieve this complete dominance. Any number of factors could intervene and turn the trend in a totally new direction. One such factor might be the ‘campaign’ against *þágufallssýki* mentioned earlier. Considering the effects the campaign has already produced, there is a risk that only part of the population might learn the older ‘correct’ grammar. The remainder would be left with an innovative grammar which would be deemed inferior. According to Svavarsdóttir (1982), Thráinsson feels that Icelandic would in effect be split into two social dialects. Even more drastic consequences have been warned against if *þágufallssýki* is not allowed to proceed. Rögnvaldsson (1983) speculates that the entire casemarking system might be in danger if the cases are not allowed to naturally assume the new functions outlined in (39).

The DAT trend seems, however, to be a strong one. Halldórsson (1982) dates the very first examples of *þágufallssýki* from around 1850, and although they were rare in the beginning they are now quite common in the spoken language.

Even if the DAT trend is never totally fulfilled, indications are that the oblique subjects themselves will survive. They have already survived one period of weakness in the 16th Century, and they are today a very important means of distinguishing between personal and impersonal verbs. We have already seen documented evidence that the distinction is a real one for speakers. Svavarsdóttir (1982) mentions that there is also evidence that oblique subjects are being used even with personal verbs which happen to share strong semantic similarities with regular impersonals. Two isolated examples are the verbs *hlakka til* 'to look forward to', and *kviða* 'to fear'. Oblique subjects are showing no signs of disappearing from Icelandic.

6.0 CONCLUDING REMARKS

This paper has presented both synchronic and diachronic views on oblique subjects in Icelandic. While oblique subjects in passive constructions have been the main topic of discussion, their relationship to the oblique subjects in impersonal constructions has been noted and examined. Evidence has been presented that the oblique subjects are true subjects and not moved objects. This in turn has meant the rejection of the GB analysis of passives and the acceptance of LFG's lexical analysis of the passive. Casemarking has also been shown to be a lexical process, and a casemarking model has been implemented for Icelandic. This model adequately predicts the casemarking and agreement phenomena observed in the passive constructions.

The model furthermore gives valuable insight into the diachronic developments affecting the oblique subjects. It theoretically allows NOM and ACC nouns to share some of the same qualities, most importantly the quality of carrying an agreement specification. This creates an opaque context which directly affects constructions containing oblique subjects. It has been suggested that the Transparency Principle is currently working to remove this opaque context. As evidence that a language change is in progress, we have seen double forms representing a tendency known as *þágufallssýki*. The indications are that language learners are now acquiring a new rule in their grammar which treats the impersonals as a class requiring a DAT subject. Among the reasons which may be influencing the development in this direction is the patterning of DAT subjects in passive

constructions. We cannot predict whether the trend toward DAT subjects will ultimately become the norm, but we can say that oblique subjects are a firmly-established part of Icelandic grammar.

NOTES

- * I would like to thank my adviser Elisabet Engdahl, my Icelandic teacher Kristinn Jóhannesson, and my friend Guðrún Gísladóttir for their invaluable help in the making of this paper. I am also grateful to Kjartann Ottosson for additional comments and to Christian Collberg for support and encouragement.
- 1 Several types of constructions may be classified as impersonal according to Lindqvist (1912):
 - a) verbs requiring an infinitive or clausal complement.
 - b) verbs having a placeholder (dummy) subject.
 - c) verbs whose 'psychological subject' (experiencer) is not the same as the grammatical subject.
 - d) verbs describing meteorological phenomena.
- 2 Most passive sentences in Icelandic do not have an *af* agent phrase, but it is possible to include one.
- 3 Sentence (11) may appear to be an instance of topicalization, however it will be shown in section 4.2 that *henni* is not a topicalized object but the real subject of the sentence. In spite of its NOM casemarking, *blíarnir* is an object.
- 4 (21) gives the lexical passivization rule for English. In the universal version of the rule BY OBJ is expressed as OBL. To account for the encoding changes in constituent structure, the following can be added to (21):

$$V \rightarrow V_{\text{part}}$$
- 5 'Regularly casemarked' here means 'direct NP', a term which will be introduced in the casemarking model (26). (23a) accounts for the change in function assignments observable in the functional structure. (23b) ensures that the accompanying change in the verb form is also made in the constituent structure.
- 6 The if-then condition on casemarking in iv) requires that one have access to both the object NP and the subject NP simultaneously. In an LFG functional structure one does have access to both NP simultaneously. In a GB framework it would not be possible to express such an if-then relationship because the subject and object are members of different phrasal projections and are given different governors.
- 7 OBJ1 is the indirect object and OBJ2 the direct object. I have adopted these names for them from the usual practice in LFG.

- ⁸ This is questionable. Agreement takes place even in languages like English where the passive is easily argued to be a matter of np-movement:
The cars were stolen e.
- ⁹ Of 58 noun paradigms listed in the *Svensk-isländsk ordbok*, 19 show equivalent NOM and ACC forms. The addition of definite articles destroys this equivalency, but I think it is worth noting nevertheless.
- ¹⁰ Children are taught to substitute a word such as *hestur* for which each case form is distinct.
- ¹¹ Only 2 neuter noun paradigms do not distinguish between NOM and DAT.
- ¹² The unacceptability of (38b) may admittedly be due to the fact that impersonal verbs seem to lack past participle forms.

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GPSG and the Verb-Second Phenomenon in Swedish*

Sheila Dooley Collberg

1.0 INTRODUCTION

An important part of research within the framework of any syntactic theory consists of attempts to apply the theoretical primitives to describe actual empirical data from natural languages. This paper is a report on such an attempt. The verb-second (V/2) phenomenon in Swedish was chosen as a 'test' case for Generalized Phrase Structure Grammar (GPSG) because of the wealth of relevant data already written within the GB syntactic framework and because of the complexity of the data which must be described. The differing word orders in Swedish main and subordinate clauses present a particular challenge to the ID-LP rule format which forms the basis of any GPSG grammar. The possible placements of sentence adverbials and clitic-like pronouns further complicate the data and test the descriptive and predictive powers of GPSG metarules and syntactic feature conventions.

After presenting a short summary of the Swedish data and the existing GB account for it, I will introduce basic GPSG rules and features. An alternative account for the V/2 phenomenon in Swedish written in a GPSG framework will then be suggested. The remainder of the paper will consist of a discussion of the implications of adopting such an account.

1.1 GB and Swedish word order

All Germanic languages except English exhibit what is known as the V/2 phenomenon: in declarative main clauses and constituent questions, only one constituent may occur before the finite verb. In yes/no questions, the finite verb occurs in first position. In Swedish, these two word orders may be referred to as V/1 and V/2. Examples (1)-(6) illustrate the possible variations of V/1 and V/2 (Platzack 1986). The finite verb is printed in boldface in each example.

- (1) V/1 with auxiliary verb:
Hade Erik verkligen köpt boken?
 had E. really bought the-book
- (2) V/1 with main verb only:
Köpte Erik verkligen den boken?
 bought E. really that book
- (3) V/2, declarative main clause:
 Erik **köpte** verkligen boken.
 E. bought really the-book
- (4) V/2 with auxiliary verb:
 Erik **har** köpt boken.
 E. has bought the-book
- (5) V/2, topicalization:
 Boken **köpte** Erik i London.
 the-book bought E. in London
- (6) V/2, constituent question:
 Vad **köpte** Erik i London?
 what bought E. in London

Swedish also exhibits a third word order, V/3, in which the finite verb appears in third position. Usually it is a sentential adverb which intervenes between the subject NP and the verb to produce this order. The intervention is obligatory rather than optional, as (8) illustrates. V/3 is the normal word order for Swedish subordinate clauses which contain a sentential adverb. V/3 is not generally acceptable in main clauses such as (9), but it may occur, depending on the nature of the adverb involved. *Kanske*, as in (10), often produces V/3 order in main clauses.

- (7) Jag undrar om [Erik verkligen **köpte** boken.]
 I wonder if E. really bought the book
- (8) *Jag undrar om Erik köpte verkligen boken.

(9) *Erik verkligen köpte boken.

(10) Erik kanske köpte boken.
E. maybe bought the-book

GB syntacticians generally agree that the V/2 phenomenon is the result of moving the finite verb from its original position to a higher node in the structure, usually COMP. There may be disagreement over the reasons why such a move takes place, but that it does seems to give a good account of the data observed in the Germanic languages (Platzack 1985).

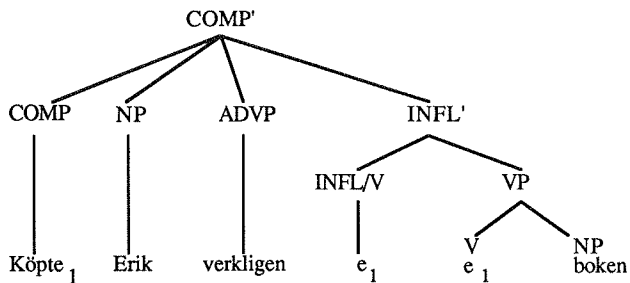
Christer Platzack (1986) has explained the move in terms of casemarking. He assumes the structures shown in (11), (12), and (13) for Swedish V/1, V/2, and V/3 clauses, which correspond to sentences (2), (3) and (7) above. The finite verb must always be moved up to an empty COMP node in order to act as a case-assigning governor for the subject NP. If the subject NP is left in its original position, a V/1 clause is formed as in (11). V/2 clauses are formed by additionally moving the subject NP to a higher XP node under COMP" as in (13). V/3 clauses involve no movement at all.¹ The finite verb remains in its original position since COMP is already occupied by a subordinating conjunction. This analysis is attractive for a number of reasons. It implies that the finite verb and complementizers enjoy complementary distribution, and consequently that V/1 order is impossible in subordinate clauses. It also automatically predicts the different placements of the sentential adverb in main and subordinate clauses while still giving both kinds of clauses the same underlying constituent structure. Finally, the motivation for the movement of the finite verb in terms of case assignment requirements gives the analysis an appealing measure of explanatory power.

2.0 BASIC CONCEPTS IN GPSG

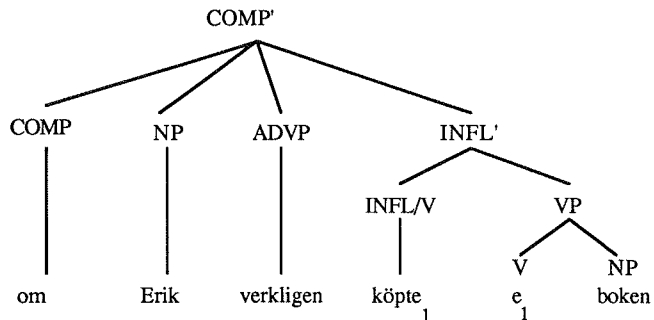
What might a GPSG-based account of the V/2 phenomenon have to offer that is different from this GB account? The answer lies first of all in the differing theoretical formalisms employed by the two theories. The version of GPSG assumed here is the one found in Gazdar, Klein, Pullum, and Sag (1985, henceforth GKPS).

A set of immediate dominance (ID) rules and linear precedence (LP) rules forms the basis of any GPSG grammar. The ID rules are much like GB-type PS rules in that they specify how a phrasal category can be

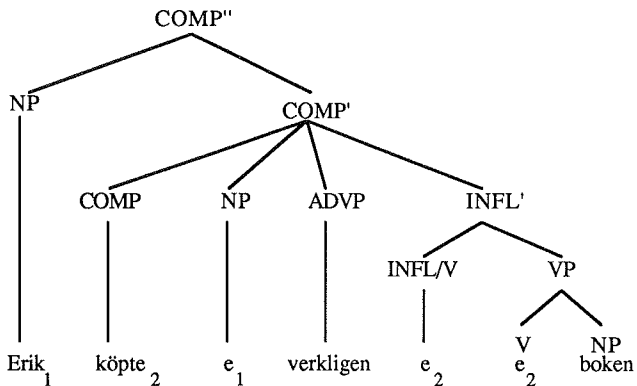
(11) V/1 with main verb only:



(12) V/3 subordinate clause:



(13) V/2, declarative main clause:



expanded and follow the conventions of X-bar syntax. They are different from PS rules, however, in that they say nothing about the linear order in which the daughter constituents of a category must appear. This is instead specified in the LP rules. ID-LP rules take the following form:

- (14) a. ID rule: $XP \rightarrow X, Y, (Z)$
 b. LP rule: $Y < Z$

(14a) states that the phrasal category XP will have as daughters X , Y , and optionally Z . The LP rule (14b) requires that Y stand before Z . It does not specify any order between X and Y , however. In this case, then, the grammar will allow either the sequence X, Y or Y, X .

Of course, it is not always possible to make straightforward statements like (14b) about the linear order of constituents. This will become apparent when we look at the placement of Swedish adverbials later on. It may be necessary to refer to syntactic features on categories in order to specify the linear order(s) allowed in a particular language.

GPSG greatly exploits the use of syntactic features on categories. Syntactic features are characterized by how they spread throughout a structure. They may be 'head' features and spread between a mother category and its head daughter constituent, or they may be 'foot' features and spread between a mother and a daughter other than the head. The Head Feature Convention (HFC) and the Foot Feature Principle (FFP) regulate these two kinds of feature transferral. There are some features which are used frequently in GKPS and which will be referred to in this paper:

- (15) a. SUBCAT — Takes integer values 1-n or specific lexical items such as complementizers. Functions to give the same information as a lexical subcategorization frame in GB. Ex: $V[13] = \text{'verb, class 13'}$, $[COMP \text{ that}] = \text{'complementizer that'}$.
- b. CASE — NOM, ACC, DAT, GEN, etc.
- c. FIN — + or - finite.
- d. SL — 'SLASH'. Takes a category value. Indicates the existence of an empty category within a phrase. Ex: $S/NP = \text{'an S with a missing NP'}$.
- e. NULL — An empty category signalled by SL.
- f. INV — + or - inverted word order.

- g. Q — + or - interrogative. +Q is actually an abbreviation for the foot feature [WH NP [WHMOR Q]], which introduces an interrogative NP.

In addition to following the spreading conventions set up by the HFC and the FFP, the behavior of syntactic features is also regulated by Feature Cooccurrence Restrictions (FCR) and Feature Specification Defaults (FSD). Like the syntactic features themselves, these may be universal or language-specific in nature.

Metarules are a device for abbreviating a set of ID-LP rules. They allow us to systematically derive new ID rules from the basic ones already given. Metarules are only allowed to operate upon lexical ID rules (that is, ID rules which introduce a lexical head), and consequently can only affect one phrasal projection at a time. Metarules may introduce new daughter constituents or new syntactic features into an ID rule, but they cannot on their own affect linear order. Linear order is always defined solely by the LP rules.²

Metarules are often used to derive the ID rules necessary for generating special unbounded dependencies such as questions and relative clauses. One important metarule which we will make use of later is the Slash Termination Metarule 1 (STM1):

$$(16) \text{XP} \longrightarrow \text{W}, \text{XP} \Rightarrow \text{XP} \longrightarrow \text{W}, \text{XP}_{[\text{NULL}]}$$

STM1 introduces a +NULL category, and an FCR forces that category to be marked SL. The Foot Feature Principle further guarantees that the whole phrase will be marked SL. W is a multiset variable over categories, and XP can be realized as any phrasal category. This metarule, then, is a very general rule since it may apply to any and all lexical ID rules in the grammar. Other metarules are more specific in their choice of input, sometimes referring to syntactic features required on categories of the input ID rule.

Linking rules are a complement to the metarules for introducing empty nodes. The metarules can introduce an empty category and the SL chain which accompanies it, but they still only refer to one local tree. It is a linking rule which creates the position for the 'missing constituent' in a higher local tree. Linking rules take the form of a regular ID rule; they do not take one ID rule as input and give a new ID rule as metarules do.

Instead, they produce variations by using category variables in place of fully specified categories. The XP in (17) may be realized as any phrasal category which appears as daughter to S.

(17) Linking Rule: $S \rightarrow XP, H/XP$

The slashed head category H/XP in (17) is the real link between the local tree produced by (17) and a local tree which has undergone STM1. The missing constituent introduced by STM1 can now take its place as a daughter of S.

3.0 A GPSG ACCOUNT OF VERB-SECOND IN SWEDISH

3.1 Basic word order in Swedish

I suggest the following ID-LP rules for Swedish:

(18) ID rules:

a. S _[COMP α]	→	(SUBCAT α), H _[-INV]	
b. S	→	NP, H, (ADVP)	
c. VP	→	H _[5] , VP	(=ha)
d. VP	→	H _[3] , NP	(=köpa)
e. VP	→	H _[55] , S _[COMP att]	(=tro)
f. VP	→	H _[66] , S _[INV, +Q]	(=undra)
g. VP	→	H _[33] , S _[COMP att]	(=veta, säga)

LP rules:

- h. NP < VP
- i. SUBCAT < SUBCAT
- j. ADVP < VP
- k. ADVP < NP_[CASE ACC]

These ID-LP rules will produce local trees which may then be combined to form larger trees corresponding to fully expanded Swedish sentences like those given in section 1. These ID-LP rules alone can only produce V/2 or V/3 structures, however, depending on whether we choose to insert the optional sentential adverb. We may therefore classify these structures as the basic word orders in Swedish. They also happen to be the only word orders allowed in Swedish subordinate clauses. On the basis of Ross' Penthouse

Principle (1973), it is generally accepted that the word order in subordinate clauses should be regarded as the underlying or more basic word order in most languages (Platzack 1985). This observation is applied here as well.

In order to distinguish these two basic word orders from the other, 'derived' word orders, it is convenient to use the head feature, INV (inverted),³ The feature -INV may be specified as the unmarked case for Swedish by means of a feature specification default:

(19) FSD 1: -INV

The -INV feature may then be exploited in ID rule (18a) to ensure that only the basic V/2 and V/3 -INV structures are allowed as embedded clauses. Word orders distinguished by +INV will be barred from appearing as embedded clauses.⁴ The possible word order types in Swedish and the methods suggested for generating them may be summarized as follows:

- (20) V/1 +INV < ID-LP, Aux Metarule
 V/2 +INV < ID-LP, Aux Metarule, Linking Rule, STM1
 V/2 -INV < ID-LP
 V/3 -INV < ID-LP with optional ADVP or STM1

3.2 V/1: The Aux Metarule

In GKPS, the English phenomenon of subject-auxiliary inversion is elegantly accounted for by the use of a simple metarule. The inversion effect is achieved not by any real movement but by the introduction of an NP subject into a VP ID rule. The same principle can be used to write a metarule for Swedish to produce V/1 clauses and in so doing 'mimic' the movement of the finite verb to COMP:

- (21) Aux Metarule:
 $VP_{[+FIN]} \rightarrow H, W \Rightarrow S_{[+INV]} \rightarrow H_{[+FIN]}, NP, W$

The Aux Metarule must be applied to the existing ID rules in the grammar. Since metarules may only take lexical ID rules as input, it can only be applied to VP ID rules which contain lexical heads. The feature +FIN furthermore ensures that the metarule only operates on a VP local tree containing the finite verb. The metarule introduces an NP into the original

ID rule and renames the local tree as $S_{[+INV]}$. The resulting structures correspond to the V/1 sentences (1) and (2) from section 1.1:

(22) $[S_{[+INV]} [V] [NP] [NP]]$

(23) $[S_{[+INV]} [V_{[+FIN]}] [NP] [VP [V] [NP]]]$

English only exhibits V/1 order when there is an auxiliary verb present. It is not surprising, then, that our Swedish metarule based upon the English one seems to work best when there is an auxiliary verb, as in (23). In the absence of an auxiliary, the resulting structure is flat and the VP node has disappeared entirely. The metarule has the effect of collapsing what would have originally been two S and VP local trees into one single $S_{[+INV]}$ local tree.

The loss of the VP node does not seem to be a problem for a GPSG description of Swedish. It is problematic for a GB description, however. The necessity of the VP node can be tested by attempts at VP coordination, as in (24). In keeping with Platzack's GB analysis which was reviewed earlier, the test becomes one for INFL' coordination.

(24) Erik $[_{INFL'} [_{INFL'} köpte en pistol] och [_{INFL'} dödade sin bror]]$
 Erik bought a gun and killed his brother

In such a GB analysis, it is only possible to conjoin similar constituents. Coordination in (24) is only possible if we retain the full INFL' structure containing the original VP nodes. VP conjunction is not a valid test for VP status given the manner in which coordination is treated in a GPSG grammar. According to GKPS, coordination is achieved by means of coordination schemata in which each daughter conjunct is a head, but it is not necessary for the daughters to be categorially identical. Our GPSG grammar might generate (24) in this manner:

(25) Coordination schema: $S \rightarrow H, H[CONJ och]$
 Erik $[S_{[+INV]/NP} köpte en pistol] [VP_{[CONJ och]}] och [VP dödade sin bror.]]$

Thus the loss of the VP node after application of the Aux Metarule does not seem to hinder coordination. Instances of coordination which also

traditionally involve optional deletion under identity may also be easily generated, as in (26) and (27):

(26) Erik köpte en bok och Lisa (köpte) blommor.
E. bought a book and Lisa (bought) flowers.

(27) Köpte Erik en bok och (köpte) Lisa blommor?

GPSG does not directly address the issue of stylistic deletions, but there is some discussion of VP ellipsis in GKPS. It seems reasonable to allow V ellipsis as well. The flat, VP-less structure of (22) should therefore be accepted as an admissible structure for a Swedish V/1 clause.

3.3 V/2: The Linking Rule, Slash Termination, and [Q]

There are two possible V/2 orders which may be generated by the GPSG grammar presented in this paper. One is the underlying -INV order which may only appear in embedded clauses. The following are admissible V/2 -INV structures:⁵

(28) [_{S[-INV]} [NP] [_{VP} [V] [NP]]]

(29) [_{S[-INV]} [NP] [_{VP} [V] [_{VP} [V] [NP]]]]

There is also a +INV V/2 order which is limited to appearing in main clauses. The surface strings which can be associated with -INV and +INV V/2 structures are at first glance identical. Compare example (4), for instance, with the embedded V/2 clause in the following sentence:

(30) Jag tror att [_{S[-INV]} Erik har köpt boken.]
I believe that E. has bought the-book

One may question whether it is really necessary to assume two V/2 variants, each with its own feature specification, derivation, and internal structure. A closer look at constructions other than simple declaratives and a comparison of how they behave in main and subordinate clauses suggests that the distinction is indeed motivated.

Topicalizations and questions are unbounded dependencies which are handled in GPSG using STM1 (16) and the Linking Rule (17). The Linking

Rule cannot refer to the feature INV, since it must be free to produce unbounded dependencies in both embedded or main clauses. But we must make use of other syntactic features to ensure that certain ungrammatical instances of unbounded dependencies are not allowed. For example, topicalizations are in general not allowed in Swedish embedded clauses (31a). The simplest way to express this is to make use of a feature cooccurrence restriction (31b). This restricts topicalizations to appearing in main clauses (i.e. +INV) without restricting the domain of application of the Linking Rule in general.

- (31) a. *Jag undrar [om boken köpte Erik i London.]
 I wonder if the-book bought E. in London
 b. FCR: +TOP → +INV

There exists, however, a specific class of matrix verbs which will optionally allow topicalizations in embedded clauses. These are typically verbs used to make assertions, such as *veta* ('know') and *säga* ('say'):

- (32) Jag vet att [boken köpte Erik i London.]
 I know that the-book bought E. in London

- (33) Hon sade att [i London köpte han boken.]
 She said that in London bought he the-book

These embedded topicalizations need not jeopardize the distinction we have assumed between +INV and -INV clauses. On the contrary, we can choose to follow Holmberg (1983) and regard them as instances of embedded main clauses. Since only a certain class of matrix verbs will allow such embedded main clauses as complements, we can easily express this in the SUBCAT feature of these verbs and in the ID rule associated with them by leaving the INV feature unspecified (18g). They are then able to take either +INV or -INV complements.

As Holmberg demonstrates, these verbs of assertion are not limited to taking topicalizations as complements. As the rule predicts, they are able to take complement clauses showing any of the other characteristics of main (i.e. +INV) clauses, such as contrastive dislocation (34) and V/2 word order even with an optional adverb present (35):

(34) Jag vet att Erik, honom kan man lita på.
I know that Erik him can one depend on

(35) Hon sade att Erik köpte aldrig boken.
She said that Erik bought never the-book

If we maintain that the distinction between main and subordinate clauses is a distinction between +INV and -INV and accept the possibility of embedded main clauses, we are able to describe the distribution of sentences like (32) - (35) correctly. Otherwise, such examples seem to defy description.

Constituent questions are frequently found in embedded clauses, and here the distinction between +INV and -INV becomes particularly crucial to word order. (36a) shows that embedded constituent questions in Swedish may never show the normal V/2 order which they do in main clauses. Instead what we find is a kind of V/3 order shown in (36b).

(36) a. *Jag undrar [vad köpte Erik i London.]
b. Jag undrar [vad Erik köpte [+NULL] i London.]

To achieve the proper distribution of embedded constituent questions, we can again make use of the SUBCAT feature. Only certain matrix verbs such as *undra* ('wonder') may take embedded questions as complements, and this is expressed directly in the ID rule (18f). The -INV feature will rule out ungrammatical word orders such as (36a). The +Q feature is freely instantiated and introduces a word with WH morphology (in this case *vad*, 'what') in the place of the missing constituent created by the Linking Rule.

Example (36b) shows the +NULL feature instantiated on the object NP. If we examine how +NULL can be made to appear on the subject NP as well, we discover still more differences between main and subordinate clauses. Notice that in the main clause question (37a), +NULL could just as easily have been instantiated on the subject NP, since both subject and object NP are daughters of the same projection, namely the lexical ID rule for $S_{[+INV]}$ created by the Aux Metarule. We could have obtained (37b) by the same derivation:

(37) a. Vad köpte Erik [+NULL] i London?
b. Vem [$S_{[+INV]}/NP$ köpte [NP +NULL] [NP boken] [pp i London?]
who bought the-book in London

But in an embedded constituent question such as (36b), the subject and object NP are not sisters in the same local tree. Only the object NP is included in the projection of a lexical ID rule, and thus it is the only NP which can be affected by STM1. We cannot introduce +NULL onto the subject NP of a -INV clause by using a metarule.

The subject NP of an embedded question in Swedish can never, in fact, be realized as +NULL. A 'placeholder' constituent, *som* ('which'), is required instead. The placeholder *som* is only required in embedded questions and is directly ungrammatical in main clause questions.

- (38) a. *Jag undrar vem [+NULL] köpte boken.
 b. Jag undrar vem **som** köpte boken.
 c. *Vem **som** köpte boken?

The behavior of *som* is often difficult to describe in a GB grammatical framework because it requires reference to concepts such as 'subject' and 'object' and to the difference between main and embedded questions. Often the need for *som* is explained by the use of the Empty Category Principle (ECP) and the concept of proper government of empty categories (Engdahl, lectures). But since our GPSG grammar gives main and embedded clauses different derivations and consequently different structures, there is no need to refer to the concepts 'subject' and 'object'. The explanation for the distribution of empty categories is instead dependent upon the very general principle that metarules can only apply to the lexical ID rules of the grammar. The subject and object NP automatically receive a different structural status entailing different possibilities for feature specification and metarule application. The facts surrounding the use of *som* are then predicted by the grammar.⁶

Throughout this section we have seen how the interaction of ID rules, metarules, and feature specifications tailor structures precisely to fit the word order requirements of main and subordinate clauses. The crucial feature has consistently been the distinction made between +INV main clauses and -INV subordinate clauses. This is true even in the case of V/2 clauses, which often exhibit the same surface string order as either main or subordinate clauses. Much more important than this surface similarity is the fact that the distinction between -INV and +INV carries with it structural differences concerning the position of the subject NP. In -INV V/2 clauses, the subject NP must remain a daughter to S, while in +INV clauses it

becomes a sister to the finite verb. The distribution of topicalizations and constituent questions support the need to refer to this structural and featural difference. It is therefore necessary that the grammar be allowed to generate two kinds of V/2 clauses.

3.4 V/3: The placement of sentential adverbs

The placement of sentential adverbs is what most clearly distinguishes main from subordinate clauses in Swedish. V/3 order — with the adverb placed between the subject NP and the finite verb — is virtually limited to subordinate clauses. In main V/1 and V/2 clauses, the adverb usually appears directly after the finite verb.

The structural difference between -INV and +INV clauses again forms the basis for a whole chain of interactions between ID-LP rules, metarules, and feature specifications to achieve correct placement of sentential adverbs. Compare a basic -INV and +INV structure again, this time with a possible adverb inserted:

- (39) a. [_{S[-INV]} [NP] [ADVP] [_{VP} [_{V[+FIN]}] [NP]]]
 b. [_{S[+INV]} [NP] [_{S[+INV]/NP} [_{V[+FIN]}] [NP] [ADVP] [NP[+NULL]]]]

The only acceptable position for an adverb in (39a) is before the finite verb; in other words, as a daughter to S[-INV]. The adverb is in this position part of a non-lexical ID rule. The simplest way to correctly introduce an adverb into this position is to offer it directly as an optional constituent in the basic ID rules of the grammar, and this is the approach adopted here. The relevant ID rule is (18b).

Allowing the adverb to be inserted directly from the ID rules not only places it correctly in -INV clauses but also effectively bars it from appearing in the same position in +INV clauses. This is precisely the effect desired. Since all +INV clauses are formed by the application of the Aux Metarule, only material appearing in a VP rule used as input to the metarule can appear in the resulting +INV clause. The Aux Metarule can only 'look at' the lexical ID rule for the VP, and there it will never see any adverb. The ID rule (18b) can only insert adverbs into S. Unless we provide the grammar with another means of introducing adverbs, all +INV clauses will be barred from containing them.

Swedish +INV clauses certainly do contain optional adverbs, so there must be an alternative method of inserting them. The most acceptable position for an adverb in a +INV clause like (39b) is as a sister to the finite verb. The adverb is now in this position part of a lexical ID rule — the opposite of the situation in the -INV clause (39a). It seems quite natural to exploit this opportunity for the use of a metarule to insert adverbs in +INV clauses:

(40) Adverbial Metarule: $S \rightarrow W \Rightarrow S \rightarrow W, ADVP$

The metarule will only operate on $S_{[+INV]}$, since it is only $S_{[+INV]}$ which have lexical heads.

The placement shown in (39b) is the ‘most acceptable’ or preferred one. There are, in fact, other options open for what linear order the sentence may receive. This is because the $S_{[+INV]}$ clause is so flat and can contain many daughter nodes. Let us examine the possibilities available using the adverb *inte* (‘not’) inserted in structure (39b).⁷

- (41) a. *Boken [$S_{[+INV]}$]/N *inte* köpte Erik [+NULL].]
 b. Boken [köpte *inte* Erik [+NULL].]
 c. Boken [köpte Erik *inte* [+NULL].]
 d. *Erik [köpte [+NULL] boken *inte*.]

The first possibility, (41a), is to have the adverb as the first daughter to S , before the finite verb. This is ungrammatical, at least in +INV clauses. The LP rule which prevents the grammar from allowing the adverb in this position is a very general one introduced in GKPS and referring to the feature SUBCAT. It was given as (18i). Categories bearing the feature SUBCAT must come before those without it. Here V is specified for SUBCAT, while adverbs (which are introduced as the phrasal category ADVP) are not. The finite verb must therefore precede an adverb when the two are sisters in the same local tree.

The next two possibilities are to have the adverb after the finite verb, either before the subject NP (41b) or after it (41c). Both can be allowed by the LP rules of the grammar by simply leaving the order between ADVP and NP undefined. If neither one is given precedence over the other, then both orders will be acceptable.

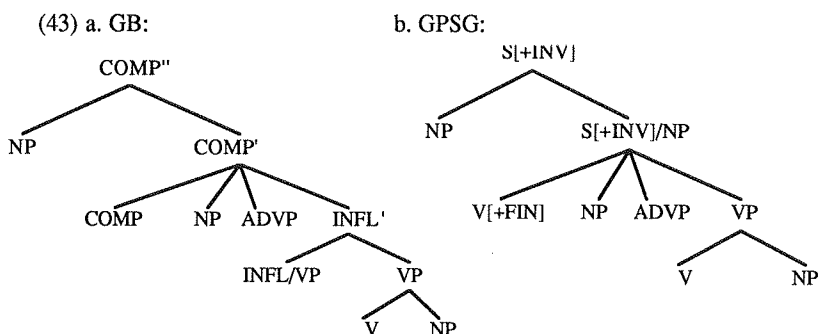
The last possibility is to place the adverb after the object NP as in (41d). The two previous examples suggested that there was no order of precedence between ADVP and NP, yet here we must find some means to order them. This can be done by using the feature CASE. The subject NP in Swedish will always carry the feature [CASE NOM], while the object will usually carry the feature [CASE ACC]. LP rules can refer to syntactic features just as ID rules can. The LP rule which bars sentences like (41d) was given as (18k).

These LP rules can only give an idea of the general principles governing the placement of sentential adverbs in Swedish. There are, of course, many other adverbs besides *inte*, and many of these follow somewhat different patterns than the ones shown in (41). Even the behavior of *inte* is not quite as straightforward as the previous discussion implies. Consider the following contrast:

- (42) a. *Erik såg Per inte.
 E. saw P. not
 b. Erik såg honom inte.
 E. saw him not

It was established with (41d) that adverbs should precede object NP, yet here we have an apparent counterexample in (42b). Nevertheless, the grammar can still be made to account for examples like (42b) without contradicting the LP rule (18k). Besides carrying the feature [CASE ACC], the object NP *honom* can also carry a feature +PRO to distinguish it as a pronoun. It may even be said to have the status of a clitic pronoun, as suggested in Holmberg (1984), so we may want to let it carry the feature +CLITIC as well. These additional features can be referred to in other LP rules to allow for the acceptability of sentences like (42b).⁸

The idiosyncrasies of adverbial placement in Swedish are so pervasive that any description would probably require reference to many more syntactic features than the ones already mentioned. A very preliminary examination of the possibilities suggests that adverbs can be grouped into different classes according to features such as negative content (*inte* 'not', *aldrig* 'never'), temporality (*alltid* 'always', *aldrig*), and notions of doubt or confirmation (*kanske* 'maybe', *verkligen* 'really', *antagligen* 'probably; presumably'). If some definite correlation can be discerned between the presence of such syntactic features and the grammaticality of linear orders



of adverbs, then we will have found a possible solution to the problem of describing the behavior of Swedish adverbs. The point is that a GPSG grammar provides us with the means to account for optional word orders besides the basic preferred ones which must be accounted for.

4.0 CONCLUDING REMARKS

Let us conclude by comparing the two syntactic structures assumed by the two syntactic theories which have been discussed (43). These two structures are more or less identical. Constituents may be given different names or manipulated by different mechanisms in the grammar, but the resulting word orders are the same.

Consequently, this GPSG grammar for Swedish seems to be an adequate descriptive analysis, but lacking in some basic explanatory foundation for the presence of the V/2 phenomenon in Swedish. Several times we have been able to see hints of a kind of explanatory adequacy in instances where the basic theoretical assumptions of GPSG have correctly predicted how the interaction of rules and features can produce typical V/2 word orders (for example, the prediction that *som* is obligatory in embedded clauses). Nevertheless, this does little more than confirm that the empirical data from Swedish seems to support the lexical constraint on metarule application or the proposed principles for feature spreading. It does not really give any clear indication of a fundamental explanation for the V/2 word orders. Within a GB framework we might explain the V/2 order by saying that the subject NP must receive casemarking;⁹ the corresponding explanation within GPSG seems to be that metarules are only allowed to affect lexical ID rules. The value of both of these explanations depends ultimately, of course, upon the value of the basic theoretical assumptions underlying them.

NOTES

- * I would like to thank my adviser, Elisabet Engdahl, for helping me to develop the ideas in this paper. Special thanks to Christian Collberg for his invaluable technical assistance in preparing the final manuscript.
- 1 I am disregarding the movement of the finite verb to INFL, which Platzack maintains is made in order for it to pick up tense features on its way to COMP.
 - 2 This does not imply that metarules can never have any effect at all on linear order. On the contrary, their interaction with LP rules and syntactic feature instantiation can cause very interesting variations in word order.
 - 3 'Derived' here does not imply that +INV structures are derived by first generating underlying V/2 and V/3 -INV structures. +INV structures are derived in the sense that we apply metarules directly to the ID rules already listed in the grammar to produce new ID rules and consequently generate new local trees. No analogy with transformations is intended, even though a similar effect is achieved.
 - 4 +INV clauses may be embedded, however, if the ID rule for a certain verb leaves the INV feature on its complement unspecified. This is the case in (18g), which will be presented fully in section 3.3.
 - 5 Adverbs have been omitted for the moment. The position of optional sentential adverbs will be discussed in detail in section 3.4.
 - 6 As always, the data is not as crystal clear as our grammatical apparatus implies. Kirsti Koch Christensen points out (personal communication) that *som* may even appear when the object NP is NULL. My own very preliminary investigation shows that native speakers disagree widely in their acceptability judgements on sentences such as these:
 - i. Han undrade vem som vi träffade [NULL] i staden.
He wondered who we met \emptyset in town
 - ii. Jag vet inte vad som jag retar mig mest på [NULL].
I know not what I bother myself most over \emptyset
 - 7 (41d) has been changed slightly so that we would not simply obtain the same surface word order as in (41c).
 - 8 De Geer (1986) uses the features PRO, WEAK, REMOR REFL, PRT ('particle'), and EXPAND in her GPSG account of the facts concerning enclitic pronouns in Swedish.
 - 9 Even the need for casemarking, however, is not fully explanatory, as Wechsler (forthcoming) points out. A true explanation for the V/2 phenomenon is one which explains why there exist V/2 languages but no V/3, V/4 etc. ones. No grammatical framework to date provides this level of explanation.

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An Expanded-INFL Syntax for Modern Irish

Sheila Dooley Collberg

Abstract

A recent proposal (Pollock 1989) within the framework of Government and Binding (GB) grammatical theory has been that the members of INFL - Agreement and Tense - should be given full constituent status as maximal projections in their own right. This idea has been applied to the syntax of Modern Irish in order both to test the universality of the expanded INFL proposal and to investigate what new perspectives it might have to offer on some remaining problems of Irish syntax. The results are presented in the following paper along with discussions of the direction they suggest for further research.

1.0 INTRODUCTION

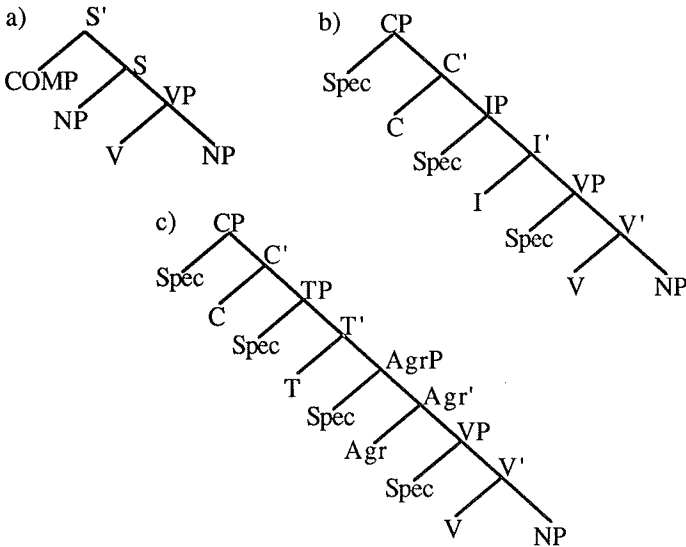
Using data from mostly English and French, J.Y. Pollock argues in a recent proposal (1989) that if the usual members of INFL, Agreement and Tense, are included in the syntax as full maximal projections, many of the phenomena surrounding auxiliaries, negation, and verb movement can receive straightforward explanations. The proposal seems readily adaptable for other SVO languages which are generally accepted as showing evidence of verb movement, notably the so-called verb-second (V/2) languages. In order to test the universality of the expanded-INFL proposal, an expanded-INFL syntax has been applied to the model VSO language Modern Irish. The result has been a quite promising new syntactic structure for Irish which seems to confirm the universality of expanded-INFL.

While it is fully compatible with existing analyses for Irish word order in which VSO is derived from SVO, the new expanded syntax is equally adaptable to an account deriving VSO from SOV. Such an account is suggested by the Irish infinitive clause, which is built around the verbal noun (VN), and which regularly shows surface SOV order. The new syntax provides an attractive solution for the placement of preverbal particles (interrogative, relative, negative, and copula), which are the only elements regularly allowed to precede the verb in Irish. It also suggests some interesting perspectives for the analysis of copula constructions, an area which remains an open question in Irish syntax.

1.1 Expanded-INFL syntax

I would like to begin by defining exactly what is meant here by an expanded-INFL syntax. This is my own terminology for the kind of structure proposed in Pollock (1989). It is probably easiest to see what is new about this structure if we compare it to earlier models of universal syntax.

(1)



Through the years, the 'basic' syntactic tree structure assumed within the GB theoretical framework has steadily grown more complex and abstract. The first tree structure (a) above shows a pre - *Barriers* (1986) type of syntax with really the bare essentials. The S portion of the tree is the area which undergoes the most change. In the second tree (b), after *Barriers*, we have a new level of constituent structure introduced: INFL (inflection). It corresponds roughly to the S level of the previous structure. We also see that there is an abstract element Agr (Agreement) which is assumed to be generated in INFL. The whole tree shows consistent 2-level expansion of X-bar syntax for each phrasal projection. The last tree above (c) is an example of the expanded-INFL syntax: The IP of (b) has grown into two fully expanded phrasal projections in their own right: AgrP and TP (Tense). This of course gives us a lot more 'room' in the syntax to propose analyses

for grammatical phenomena involving the abstract (or overt) elements Agr and Tense, namely things like the behavior of auxiliaries, subject-verb inversion, negation, quantifiers, and verb movement. As Pollock demonstrates, this kind of structure can be used to explain many of the word order details of the SVO languages French and English — details which otherwise seem unexplainable except by recourse to ad hoc stipulations.

2.0 BASIC IRISH SYNTACTIC STRUCTURE

Can the kind of structure pictured in (1c) say anything new to us about Irish? Can we implement such a structure at all for a VSO language like Irish? The answer depends in part upon how one decides to analyze the surface VSO order of Irish. There are two possible analyses, both represented in the existing literature.

2.1 VSO is base-generated

Stenson (1981) and Chung (1983) are two studies which represent the view that the VSO order in Irish is base-generated. This implies that the syntactic structure is a flat, one-level tree with all constituent phrases placed as sisters to the initial verb and no verb movement involved. It accurately represents the observed surface word order of Irish and is thus descriptively adequate, but it offers little explanation for the verb-initial order. Chung attempts to give a possible theoretical defense of the flat structure by appealing to the observation that VSO languages seem to lack the subject-object asymmetries with regard to extraction properties that one usually finds in SVO languages. However, this is not quite correct. The subject NP in Irish is much more closely tied to the verb than the object NP. While nothing can ever intervene between the subject and the verb, there are times when the object is in fact forced to move away from its canonical position. This occurs when the object is pronominal. It must appear in absolute final position in its clause, and it apparently reaches this position by means of some sort of a rule of Pronoun Postposing (Chung & McCloskey 1987). These facts suggest that the relationship of the subject and object NP to the verb is not simply one of equal sisterhood.

2.2 The SVO Analysis

If the VSO order of Irish is not base-generated, then it must arise through some sort of derivational process from a different underlying word order.

This view is implicitly supported in an article devoted to establishing the existence of a VP in Irish (McCloskey 1983). The existence of a VP entails at least two hierarchical levels of sentence structure, with the verb originating in a VO or OV constituent and obligatorily fronted to some other position. Sproat (1985) builds on the work of McCloskey to develop a full SVO Analysis for Welsh, arguing that the same analysis may be applied to Irish. The underlying structure for the two languages is argued to be SVO, and the obligatory fronting of the finite verb is made to follow from the requirements of case theory. Sproat maintains that while INFL in SVO or SOV languages may assign nominative case either to the left or the right, INFL in VSO languages is restricted to assigning case rightward. The verb lexicalizing INFL is thus forced to appear to the left of the subject NP in order to assign nominative case successfully. Sproat's SVO Analysis is a step in the right direction in that it gives a theoretically attractive explanation for the obligatory fronting of the verb, but it is incomplete in that Sproat does not specify any landing site for the conjoined verb and INFL.

Without going into any more detail, it may be said that the arguments for the SVO Analysis are quite attractive, and the general consensus among Celtic syntacticians seems to be that Irish is SVO underlyingly. In general, a derivational account like this for verb-initial languages is pretty much the norm now, as can be seen in recent works of a typological nature such as Koopman and Sportiche (1988).

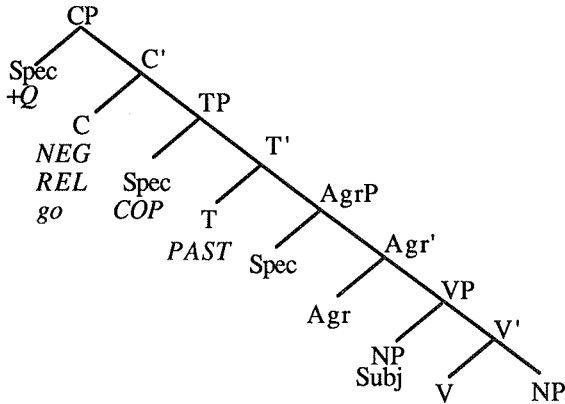
3.0 EXPANDED-INFL FOR IRISH

Obviously, it should be possible to adapt the Pollock type of syntax for Irish if we accept that Irish VSO order is derived from SVO. So let us assume that for the moment. Then, of course, there are plenty of language-specific details to work out, and the following sections contain suggestions for handling these. My proposal for the full syntactic structure of Irish is given in (2) and will be referred to throughout the ensuing discussion.

3.1 Principles and parameters according to Pollock

Given in (3) is a very brief summary of the most important points that Pollock argues for in his article. These can be reduced to a pair of universal principles (I and II) and a set of parameters (III) which vary from language to language.

(2)



(3) I. Verb movement (V-move) is a two-step process:

i. 'short' V-move to Agr

ii. [V + Agr] to T (which is the head of INFL)

II. V-move is obligatory in all [+fin] clauses because the operator [PAST] must bind a variable.

III. a. Agr is opaque in languages with poor inflection and transparent in those with rich inflection.

b. Opaque Agr will prevent theta-grid transmission when V-move takes place across it.

c. Unrestricted V- move is in essence lexically limited to those verbs that do not assign theta roles.

d. Affix movement can be a solution to instances where V-move cannot apply.

e. NegP is an inherent barrier to Affix movement.

If we can confirm principles I and II for Irish, then the remainder of our task is to set the correct variables for the parameters. I will look at each principle and parameter in turn.

3.2 V-move in Irish

If we accept the derivational SVO Analysis, then there must be V-move in Irish. The two-step conception of verb movement can complete the SVO

Analysis by suggesting a final landing site for the fronted verb. If we look at other derivational accounts of word order — for example, the V/2 analyses deriving verb-second word order from an underlying SVO or SOV — the finite verb is usually said to land in COMP. This is motivated by the distribution of the V/2 order: It is restricted to main clauses, where COMP is empty (Koster 1975, Platzack 1986).

The same cannot be said, however, for Irish. VSO order is not restricted to main clauses. Even [+fin] embedded clauses containing an overt lexical complementizer obligatorily show VSO order.

(4) Subordinate clauses in Irish:

a) [+fin] clause

Ní creidim [gur inis Cathal breag.]
 NEG believe-1sg COMP told Charles a lie
 ‘I don't believe that Charles told a lie.’

b) [-fin] clause with subject NP

Ba mhaith liom [sibh a dhul abhaile.]
 COP good with-me you-2pl go-VN to-home
 ‘I would like you to go home.’

c) [-fin] clause, \emptyset subject

Ba mhaith liom [puins a ól.]
 COP good with-me punch drink-VN
 ‘I would like to drink punch.’

It is only the [-fin] clause which may show a different order from VSO. This seems to indicate that verb movement in Irish is not dependent upon a feature of COMP but upon the value of the feature [+/- fin]. Furthermore, the landing site of the fronted verb does not seem to be COMP, since the verb is fronted even when COMP is filled with lexical material, as shown in (4a). I therefore suggest that V-move in Irish may be exactly the kind of two-step process which Pollock describes. The finite verb first moves to join with the element Agr, which is the head of AgrP, and the two consequently move up to the head of TP. Thus the final landing site of the fronted verb should be T. A look at the behavior of preverbal particles seems to confirm that this is indeed the position where the verb should come to rest.

3.3 Preverbal particles as operators

As stated in (3), the tense feature [PAST] is regarded by Pollock as an operator which obligatorily binds the verb. This assumption is easily extended to Irish, where the element expressing past tense is historically a pro-clitic preverbal particle, *do*. In Modern Irish, this particle is no longer fully overt, although phonologically its effect is still visible upon the initial consonants of verbs inflected for the past tense (5). The consonantal mutation lenition caused by the underlying *do* is the distinctive mark of the past tense upon Irish verbs. The presence of *do* is a bit more obvious upon verbs which begin with vowels. These require a *d'* prefix to signal past tense inflection (6).

- | | | |
|----------------------|--------------|--------------------------|
| (5) <i>mhol sé</i> | 'he praised' | (<i>mol</i> , 'praise') |
| <i>bhris sé</i> | 'he broke' | (<i>bris</i> , 'break') |
| <i>dhíol sé</i> | 'he sold' | (<i>díol</i> , 'sell') |
| (6) <i>d'iarr sé</i> | 'he asked' | (<i>iarr</i> , 'ask') |
| <i>d'ól sé</i> | 'he drank' | (<i>ól</i> , 'drink') |

These facts suggest that we can think of Tense as the element most closely connected to the verb and the one whose overt realization must appear directly before it. This supports placing the landing site of the finite verb in Tense.

There are other preverbal particles in Irish besides the tense marker which are equally amenable to a treatment as operators. A thorough description of these particles and their behavior is given in Stenson (1981). Only one preverbal particle is allowed before the initial verb, and if the meaning of a sentence requires that more than one particle be expressed, then the separate particles will phonologically merge to create an amalgamated form. Stenson treats the particles as 'grammaticized higher predicates' and gives the following analysis of how they combine phonologically :

- (7) Q + NEG + COP + PAST = *nár(bh)*
 Q + NEG + COP = *nach*
 Q + NEG + PAST = *nár*
 Q + NEG = *nach*

Q + COP + PAST = *ár(bh)*

Q + PAST = *ar*

Q + COP = *an*

NEG + COP + PAST = *níor(bh)*

NEG + PAST = *níor*

NEG + COP = *ní*

COP + PAST = *ba*

The ordering defined by Stenson for the particles is thus as follows:

(8) Q + NEG + COP + PAST

I have adopted this order directly from Stenson in my proposal for the expanded-INFL syntax for Irish in (2). The hierarchical stacking effect of this ordering of particles is perfectly suited to the stacked constituent structure of the expanded-INFL syntax. The decision to give the copula particle status follows Ahlqvist (1972) and will be discussed in more detail in a moment. As Pollock notes, the nature of negation may vary cross-linguistically, being a full phrasal category in only some languages and possibly varying in its placement as either specifier or complement to the members of the expanded-INFL. For the moment I do not find any evidence to treat negation in Irish as a phrasal category, so I will continue to maintain that it is a preverbal particle generated in COMP.

If the Irish preverbal particles are all treated as operators along with [PAST], then it may be possible to provide an answer to why only one particle is allowed to appear before the verb. The answer may be that the variable of the fronted verb may only be bound by one overt operator.

3.4 Agr in Irish

Now we may turn to establishing what values Irish may have for the list of parameters set up earlier in (3). As Pollock shows, these parameters are sufficient to describe how the grammars of English and French differ from each other in predictable ways. The following table summarizes how the two grammars compare.

- | | | |
|-----|--|--------------------------------------|
| (9) | English: | French: |
| | •Agr is opaque. | •Agr is transparent. |
| | •Theta-grids can NOT be transmitted. | •Theta-grids CAN be transmitted. |
| | •V-move is lexically restricted to non-thematic verbs. | •V-move is NOT lexically restricted. |
| | •Affix move is needed. | •Affix move is NOT needed. |

These parameters are all interrelated, so that we should expect to find that Irish will behave either like English or like French. The crucial point seems to be whether Agr may be said to be opaque or transparent.

If we look at Irish verbal inflection, we can see that there is some overt morphological inflection. However, it is actually quite limited. As the present tense paradigm in (10) shows, it is in fact almost parallel to what we find in English: a trace of inflection is left in only one person of the paradigm.

- | | | | | |
|------|--------------------------|--------------|-----------------------|-----------|
| (10) | 1 <i>cloisim</i> | I hear | <i>cloisimid</i> | we hear |
| | 2 <i>cloiseann tú</i> | you hear | <i>cloiseann sibh</i> | you hear |
| | 3 <i>cloiseann sé,sí</i> | he,she hears | <i>cloiseann siad</i> | they hear |

Often Irish is cited as an example of a pro-drop language, but this is not entirely correct, since the only time we get any real pro-drop is in examples like *cloisim* where there exists an inflected form of the verb to be used. I will assume, then, on the basis of the limited verbal inflection appearing on the verb, that Agr in Irish is opaque.

3.5 Non-thematic verbs: COP and *bí*

An opaque Agr will in turn imply that theta-grids in Irish will not be transmitted after verb movement. In effect, it predicts that Irish will act like English. We should find that V-move is lexically restricted in Irish, just as it is in English.

However, that does not seem to be the case. As discussed above, there does not seem to be any indication that V-move is lexically restricted in Irish. Word order seems to show that V-move occurs obligatorily in all finite clauses, whether they are main or embedded clauses. Nevertheless, we

should check the behavior of possible non-thematic verbs in Irish before deciding that V-move is indeed unrestricted.

The non-thematic verbs which Pollock identifies as the only verbs in English allowed to undergo V-move are the auxiliaries *be* and *have*. The French equivalents of these, *être* and *avoir*, are as expected the only verbs allowed to undergo V-move in the French opaque Agr context, the infinitive clause. As Pollock points out, these verbs have homonyms which carry the lexical meanings of existence and possession and which must be thematic verbs. The equivalent of *bel'être* in Irish would be the copula *is* and the verb *bí* (pres. *tá*), which also translates as 'to be'. Interestingly, Irish has no equivalent to *have/avoir*, either as an auxiliary or as a lexical verb denoting possession. There are instead two constructions used to express possession: *is* possessed *le* possessor, or *tá* possessed *ag* possessor.

- | | |
|--|--|
| (11) a) <i>Tá carr agam.</i>
be car at-me
'I own a car.' | b) <i>Is le Cáit an teach seo.</i>
COP with C. the house DEM
'Kate owns this house.' |
|--|--|

Notice that the subject in these examples must appear as the object of a locative preposition (or as in Guilfoyle (1986), the subject must be an inherently casemarked NP). This situation is strikingly parallel to the 'exotic' French verbs of existence and possession discussed in Pollock and quoted here for comparison.

- (12) *Être ou ne pas être, telle est la question.*
[PRO (ne) T pas Agr etre [e LOC]]
'To be or not to be, that is the question.'

Pollock resorts to assuming an abstract locative preposition to assign some theta role to the arguments involved in order to explain why the lexical *avoir/être* can still undergo V-move in an otherwise opaque context.

These examples from Irish suggest that we may have here an equivalent situation to the French one: that is, a locative preposition mechanism is used to assign theta roles in the face of V-move in an opaque Agr context. In fact, the evidence is much stronger in Irish than in French. We do not have to resort to motivating an abstract locative preposition in the lexicon, since we have an overt locative preposition clearly visible and absolutely obligatory in the syntax.

The same pattern construction, *tá X Prep Y*, is used to express a number of meanings other than possession that would in other languages be expressed by simple lexical verbs. Examples are listed in (13).

(13)	<i>tá a fhios agam</i>	be knowledge at-me	'I know'
	<i>tá Fraincis agam</i>	be French at-me	'I speak French'
	<i>tá aiféala orm</i>	be fear on-me	'I fear'
	<i>tá aiféala orm</i>	be regret on-me	'I regret'
	<i>tá ocras orm</i>	be hunger on-me	'I hunger'
	<i>tá súil orm</i>	be hope on-me	'I hope'

The copula is used in the same fashion to express meanings that would otherwise be expressed as simple verbs in other languages. The subject is given its theta role by the combination of an adjective and an overt locative preposition.

(14)	<i>is féidir leis</i>	COP possible with-him	'can'
	<i>b'éigean dó</i>	COP able to-him	'must'
	<i>ba cheart dó</i>	COP right to-him	'must'
	<i>ba chóir dó</i>	COP proper to-him	'should'

The above examples all have modal properties. Pollock treats the English modals as generated in Tense rather than in V. They thus do not have to undergo any V-move. Although Guilfoyle (1988) also generates the Irish modals somewhere in INFL, I think they are probably best treated in the same manner as any of the other copula constructions. We lose important word order generalizations if we treat them otherwise.

It has already been assumed following Ahlqvist (1972) that the copula acts as a kind of operator and allows a predicate adjective or noun to act in the capacity of a verb. Let us assume further that this adjective or noun given verbal status must consequently undergo V-move just as any verb would. This assumption seems to be supported both by the locative preposition facts I have just reviewed for the modals and by some word order variations observed with copula constructions expressing identification.

Irish copula constructions expressing identification might seem to have two subject NP. The extra pronoun is traditionally called the subpredicate, but it is notoriously difficult to give it any satisfactory place and explanation

in a serious syntactic proposal. For the time being my own intuition is that it is some kind of intrusive pronoun or expletive pronoun in Spec-Agr which 'shares' the subject role with the actual subject (which remains in Spec-VP). The different word orders in the examples given below may then be explained as the result of syntactic restrictions on V-move and on the placement of pronouns within the VP.

- (15) a) *Is fear é Tomás.* *Is fear [é] [Tomás [t]]*
 COP man him Thomas T Spec-Agr Spec-VP V
 'Thomas is a man.'
- b) *Is í Cáit mo bhean.* *Is ø [í] [Cáit [mo bhean]]*
 COP her Kate my wife T Spec-Agr Spec-VP V
 'Kate is my wife.'
- c) *Is í an múinteoir í.* *Is ø [í] [t [an múinteoir] í]]*
 COP her the teacher her T Spec-Agr Spec-VP V
 'She is the teacher.'

The three examples above illustrate the three consistent patterns of word order found with the copula and subpredicate. The order of (a) is that found when the predicate noun is itself a lexical head and the subject of the sentence is a full NP. In such cases, I suggest that the predicate noun undergoes V-move as any verb would. This places it in Tense, before the subpredicate pronoun. The order shown in (b) also involves a full NP subject and a predicate noun, however now the subpredicate appears immediately after the copula. The explanation for the different word order here seems to be dependent upon the nature of the predicate nominal *mo bhean*. Unlike the lexical head *fear* in (a), *mo bhean* is a phrasal category. V-move is a rule which is assumed to obey the Head Movement Constraint, so that only lexical heads may move to other lexical heads (Agr and Tense). If this is correct, then the phrase *mo bhean* will be prevented from moving, and the different word order in (b) will receive a straightforward explanation. The last word order illustrated in (c) appears when the subject is itself a pronoun instead of a full NP. In this example, the predicate nominal is a phrasal category, so it will remain in place in VP. The sentence final position of the subject may then be attributed to the obligatory rule of Pronoun Postposing, which postposes any pronouns left within the VP.

3.6 Affix movement in Irish?

Judging from the data presented in the previous section, Irish seems to use the mechanism of locative prepositions to allow movement of verbs even over an opaque Agr. The other solution, the one which English uses (according to Pollock) for verbs that assign their own theta roles, is to invoke Affix movement: the verb remains in place in VP, and the inflectional affixes move down to join it. Since we have been maintaining that Irish behaves like English, we must ask whether the solution of Affix movement is also exploited in Irish grammar. There must, of course, be some way for the host of Irish verbs other than the copula and *bí* to transmit theta-grids despite an opaque Agr. If Pollock is right, then Affix movement is to be expected in Irish.

However, assuming Affix movement for Irish then jeopardizes our entire SVO derivational account for the VSO order of Irish. If affixes are allowed to move down to meet the Irish verb in VP, then the finite verb should be found in its original D-structure position in the surface syntax. Clearly this cannot be the case. If the finite verb were to remain in its D-structure position thanks to Affix movement, then the surface word order of Irish would be SVO instead of VSO. It is absolutely essential that the verb be forced to move up to Tense in order to obtain the desired VSO order.

But perhaps Affix movement does not jeopardize an SVO Analysis after all. It will only do so if we equate the V-move of Pollock's analysis with the verb movement which results in the VSO order of Irish. Consider the consequences of regarding them instead as two totally different processes. This would theoretically make it possible to maintain that Irish has *both* Affix movement and an obligatory verb movement to [+fin], i.e. Tense. Affix movement would be necessary to solve the problem of theta-grid transmission, while verb fronting to Tense would still be made obligatory by the strictly rightward case assignment value of INFL in Irish, as claimed by Sproat (1985) and explained earlier here.

There is at least one current analysis which treats Affix movement and verb movement as different and compatible processes. Falk (1990) demonstrates that Affix movement must be assumed for Modern Swedish in order to correctly derive the correct placement of clausal adverbs, most notably negation, within subordinate clauses. Verb movement in Swedish is similar to the type found in Irish in that it is universally obligatory in finite

main clauses rather than being subject to any lexical restrictions, and its obligatoriness is attributed to the same kind of case assignment requirements as those which are assumed to force verb movement in Irish. It should furthermore be noted that Swedish Agr is recognized as being morphologically poor (Platzack & Holmberg 1990) and would thus be opaque to transmission of theta-grids. With these facts in mind, it seems reasonable to consider that the lexically unrestricted verb movement in languages like Swedish and Irish may not always be direct evidence for any lack of Affix movement. We may have to recognize two types of verb movement: one that is indeed related to the transmission of theta-grids and the nature of Agr (Pollock's V-move), and one that is forced by the requirements of the case filter in spite of the nature of Agr. It is interesting to note that this introduces a possible 'power struggle' between the demand for theta-transmission and case assignment. Just in the small sample of four languages referred to here, the two types of verb movement correlate with the presence or absence of the verb-second (V/2) phenomenon: English and French are non-V/2 showing theta-controlled V-move, while Irish and Swedish are arguably V/2 showing the case-controlled verb movement. Irish is of course verb-initial on the surface, but more and more researchers agree that VSO languages are actually only a specially related type of V/2 language (Haider 1986). The implications of these correlations are beyond the scope of this article but deserve mention nevertheless.

4.0 CONCLUSIONS AND DIRECTIONS FOR FURTHER RESEARCH

As has been shown, an expanded-INFL syntax is readily adaptable for Modern Irish. It is compatible with the SVO Analysis for the VSO word order of Irish and in addition specifies a landing site for the verb movement postulated by that analysis. It can accommodate the morphological facts surrounding the behavior of the Irish preverbal particles. It may give some new insight into the 'exotic' prepositional idioms which are so common in Irish, and it suggests a possible solution to the seemingly impossible problem of explaining varying word orders found with copula constructions expressing identification. All of this makes the expanded-INFL a worthwhile analysis to pursue further, I feel, despite the questions it raises concerning the nature of Agr and theta-grid transmission in Irish. A more detailed investigation of the properties of Irish Agr is already in progress as a sequel to the present paper.

In closing, I would like to mention one more area of Irish syntax which might appear in a new light if viewed against the backdrop of the expanded-INFL analysis. Pollock claims that V-move is restricted to tensed clauses. If this is correct, then the prediction is that we should be able to find the verb in untensed clauses in its original D-structure position. In essence, it is a restatement of the old rule of thumb that the word order in the subordinate (here untensed) clause more closely represents the underlying word order of a language. If we apply this to Irish, then we might want to consider revising the SVO Analysis and proposing an SOV Analysis instead: The word order most often found in Irish infinitive clauses is namely SOV. This was illustrated in (4b,c). The original SVO Analysis of Sproat (1985) was based upon the verb phrase VO order established by McCloskey (1983) on the basis of progressive VP like the following:

- (16) *Tá Máirtín [ag casadh amhráin]*
 be Martin at sing-VN a song
 'Martin is singing a song.'

The progressive in Irish, just like the infinitive, is formed by what is traditionally called the verbal noun. Syntactically, it is in every sense a noun (see McCloskey 1983), but with the addition of the particles *a* (-fin) and *ag* (aspectual progressive) it plays the same role as a verb in the syntax. The discrepancy between the VO order of the progressive and the OV order of the infinitive is as yet unsolved, but I think that the expanded-INFL analysis even here suggests an interesting solution to explore. If the aspectual progressive is indeed a VP, then it appears in a tensed clause, and there may be some V-move associated with it. The infinitive, being untensed, will show no V-move at all. An underlying SOV structure might just as easily be adapted to the expanded-INFL syntax presented here as is an SVO. An SOV syntax has in fact been proposed before for Irish (Sells 1984), and it may be worth reconsideration now in light of the expanded-INFL structure. Working out the details of a full SOV syntax for Irish, however, requires further research.

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The Status of Agr in Modern Irish

Sheila Dooley Collberg

Abstract

The following article examines evidence for the presence of a nominal Agr category in the syntax of Modern Irish. This Agr category is then implemented in an expanded-INFL syntax for Irish which incorporates proposals concerning the lack of Raising in Irish (Guilfoyle 1990) and extending the syntactic proposal made in Dooley Collberg (1990). The result is a structure reflecting the parametric differences found in data from Irish, Swedish, and Icelandic.

1.0 INTRODUCTION

The functional category Agr (Agreement) has been the focus of a large body of recent syntactic research and especially research dealing with the implementation of the type of expanded-INFL (or split-INFL) syntax advocated in Pollock (1989), in which Agr is the head of its own maximal projection. Although Pollock seems to imply that the AgrP is universally present in the syntax of the languages of the world, others have begun questioning whether the nature of Agr and its very existence may instead be one of the prime areas of interlanguage variation. That is the hypothesis defended in a study of parametric variation among verb-second VO languages done by Platzack & Holmberg (1990, henceforth P/H) and Holmberg & Platzack (forthcoming). There it is argued that the mere presence or absence of an Agr feature in the grammars of the closely-related languages Swedish, Danish, and Icelandic may account for certain clusterings of properties which serve to distinguish them sharply from one another. By the same token, it is argued that wholly unrelated languages may show striking grammatical similarities as a result of either possessing or lacking the same type of Agr. The properties discussed in P/H — overt subject-verb agreement, null subjects, Heavy Subject Postpositional with transitive verbs, oblique subjects, an ‘anti-Raising’ effect, and empty expletive subjects — may thus be seen as diagnostics for the presence or absence of a nominal Agr.

Whether to assume any Agr category at all in the grammar of Modern Irish is one of the most important questions which must be addressed if an

expanded-INFL syntax is to be implemented for Irish. An Agr feature has generally been assumed to appear in INFL in Irish since McCloskey and Hale's (1984) study of Irish verb inflection. The nature of Agr in Irish was questioned in Dooley Collberg (1989), but no conclusive results could be reached in that study. Now, with the assumptions of P/H and the predictions they entail about the realization of nominative NP in various positions, it is reasonable to expect that we may be able to gain more insight into the character of Agr in Irish. This will in addition provide support for the claim of P/H that the Agr parameter they define is the source of many typological structural differences in a wide variety of languages

Irish examples similar to the ones given in P/H were examined in order to test the availability in Irish of those properties and constructions which are argued to correlate directly with the presence of a nominal Agr category. The following sections discuss each of these constructions in turn along with the findings from the Irish investigation. The indications from the P/H diagnostics were sufficiently clear about the status of Agr in Irish to indicate some interesting parallels and suggest possible conclusions about Irish syntax and about how the positions of both Spec-IP and Agr should be reinterpreted in the framework of an expanded-INFL syntax. The second part of this paper will compare these conclusions to a recent proposal for Irish syntax found in Guilfoyle (1990) and reexamine the expanded-INFL proposal for Irish of Dooley Collberg (1989).

2.0 AGR: BASIC ASSUMPTIONS AND THEIR CONSEQUENCES

2.1 The Agr and finiteness parameters

P/H derive a whole body of syntactic effects from the following basic assumptions about Agr and finiteness, or [+F]:

- (1) a. [+F] may be either in COMP or INFL
 - b. Agr is inherently nominal
 - c. Being nominal, Agr must be licensed by either head government or antecedent government

The first parameter is assumed to be the distinguishing factor between languages which are verb-second (V/2) and those which are not. All V/2 languages are assumed to locate the finiteness feature in COMP, while the non-V/2 languages locate it in INFL.

The remaining parameters allow for essentially two different syntactic structures : one with an inherently nominal Agr category present as shown in Figure 1(a) and one without Agr as in (b), which we will refer to as \emptyset Agr. Although P/H classify French and English as languages with a neutral Agr, these are regarded as exceptions, so that normally the meaning of a non-nominal Agr is equated with the absence of any Agr at all. When INFL is interpreted as a category consisting of one projection and not two, the absence of Agr is merely the absence of the feature Agr on the head of INFL. In an expanded-INFL syntax, however, the lack of an Agr category should entail the lack of the entire AgrP projection in the syntax. Thus if the assumptions of P/H are correct, the character of Agr will have important consequences for any expanded-INFL proposal.

2.2 Verb movement and Affix hop

The immediate syntactic consequence of the presence or absence of Agr according to (1c) is that INFL may or may not contain sufficient lexical properties to qualify it as a proper governor for VP. When Agr is present, INFL will be a potential head governor for VP. In accordance with the Head Movement Constraint (HMC) of Chomsky (1986), a head may only move to the head which properly governs it. Consider for the moment only those languages which locate [+F] in C. Since V must move to C in order to lexicalize the finiteness feature [+F], it will be forced by the HMC to move through INFL first in order to arrive there. We can assume that V picks up the features of Tense and Agr thanks to this intermediary stop. Finally, VP is L-marked by the presence of Agr and thus does not constitute a barrier in the type of language illustrated in Figure 1(a).

The absence of Agr produces an entirely different scenario. Without benefit of the lexical properties of Agr, INFL is no longer a governor for VP. The nearest governor is now C, and V will be forced to move directly to C if it is to obey the HMC and successfully lexicalize [+F]. Without the intermediary stop in INFL, we must assume that the feature Tense joins V by means of Infl lowering, i.e. Affix hop. Finally, VP will not be L-marked and will therefore constitute a barrier.

The above will hold true also for languages locating [+F] in I, only verb movement will in this case always be a direct move to I without any intermediary stop, and Affix hop will not usually be an option.

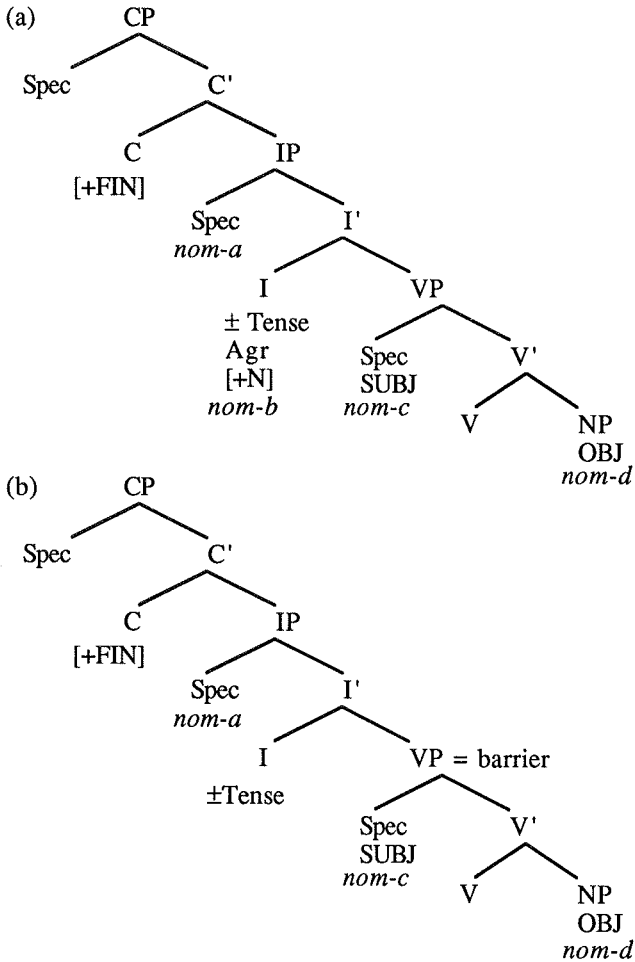


Figure 1. The structure of nominal Agr languages (a) and \emptyset Agr languages (b). [+FIN] is shown here in C for V/2 languages. For non-V/2 languages, [+FIN] would be located in I. VP is a barrier in the \emptyset Agr language, and there is no nom-b position.

2.3 Licensing of nominative arguments

The presence or absence of Agr entails differing possibilities for realizing nominative argument NP in each of the four possible argument positions available. These are labeled nom-a, nom-b, nom-c, and nom-d in the tree structures in Figure 1. P/H discuss at length whether nominative may be licensed in each, and their findings are summarized below:

(2) Position		Agr	\emptyset Agr
nom-a	(Spec-IP)	yes	yes
nom-b	(Agr in I)	yes	no
nom-c	(Spec-VP)	yes	no
nom-d	(within V')	yes	yes

Some comments are in order here. Although nom-a will be licensed in both types of languages, it must be noted that nom-a will be obligatory in \emptyset Agr languages but optional in those containing Agr. This allows for the possibility of oblique subjects being realized in the Spec-IP position of languages containing Agr, as will be discussed in section 3.2. Also, both types of languages permit a nominative argument to appear in nom-d, but this is only possible if it is coindexed with a nominative appearing in nom-a (or in nom-b for Agr languages). Finally, the possibilities diagramed above refer not only to nominative NP but also to the traces of any A-bar movements as well, since A-bar positions cannot receive case directly but must inherit it from traces. The most interesting differences appear if we look at the licensing of nominative in nom-b and nom-c. These differences become evident, at least for the Scandinavian SVO languages, if we examine the behavior of syntactic constructions which specifically involve these positions; for example, Heavy Subject Postpositional, Raising to subject, and the possibility of having oblique subjects, null subjects, or empty expletive subjects.

2.4 VSO languages and the Agr and finiteness parameters

Although P/H direct their attention mainly to the V/2 Scandinavian languages, they point out that the parameters which they assume are applicable to data from a wide variety of other languages, including those of the Celtic family. Since the location of [+F] in C is the defining characteristic of the V/2 languages, all non-V/2 languages will locate [+F] in I. That the finite verb moves directly to I has been accepted for Irish since

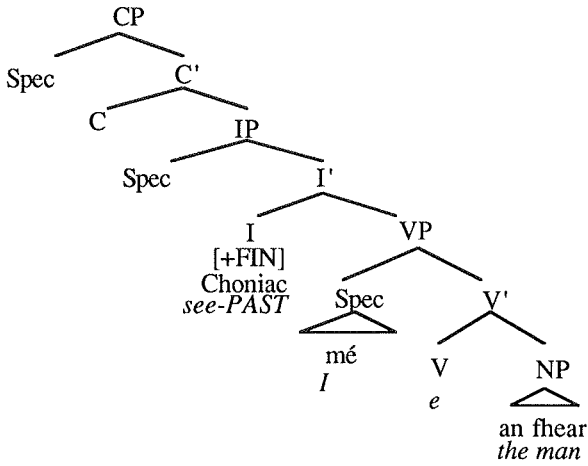


Figure 2. The SVO analysis for Irish. The subject NP is generated in Spec-VP, and the finite verb moves to I, producing the VSO word order exemplified here by the sentence 'I saw the man.'

Sproat (1985), in which the regular VSO surface order of Irish is analyzed as arising from an underlying SVO structure. This is illustrated in Figure 2. We will maintain this SVO analysis here.

Even assuming a common underlying structure for both VSO languages and SVO languages like the ones directly considered in P/H, it can be seen by comparing the structures in Figure 1 with Figure 2 that there remain important differences to consider when examining the behavior of the four argument positions directly affected by the Agr parameter. The following correspondences must be kept in mind as we discuss the specific constructions considered in P/H.

(3) Position	SVO	VSO
nom-a	Spec-IP, surface subject	—
nom-b	Agr in I	Agr in I
nom-c	Spec-VP, subject trace	Spec-VP, subject
nom-d	within V'	within V'

3.0 THE SYNTACTIC EVIDENCE

P/H exemplify the two patterns nominal Agr vs. \emptyset Agr mostly with data from the languages Icelandic, which is said to possess a nominal Agr, and Swedish, which is said to lack Agr. I will now turn to examining data from Irish modeled as far as possible on these examples and discuss whether we may say that Irish patterns more like Icelandic or like Swedish in each case.

3.1 Null subjects

As noted above in 2.3, a nominative NP will be licensed in Spec-IP regardless of the nature of Agr. However, this nominative will be optional in languages containing a nominal Agr but obligatory in those lacking an Agr. The syntactic evidence used by P/H to support this claim comes from the behavior of surface subjects in Icelandic and Swedish. Null subjects should only be possible in a language where the presence of Agr makes a nominative subject optional. Icelandic is capable of supporting such null subject NP (4), while Swedish is not (5). An overt nominative in Spec-IP is obligatory for Swedish.

(4) Icelandic:

a. Í dag hafa (**það*) komið margir málvísindamenn hingað.

today have (it) come many linguists here

b. *Dansar.

dances-3sg pres

(5) Swedish:

a. Idag har det (* \emptyset) kommit många lingvister hit.

today have it come many linguists here

b. *Dansar.

(6) Italian:

Balla.

dances-3sg pres.

Notice, however, that Icelandic is only capable of supporting non-referential null subjects, unlike Italian (6). If Icelandic and Italian both contain nominal Agr, then this difference must be attributed to some other factor. P/H's explanation is that the position of [+F] here determines whether *pro* is licensed at D-structure in Spec-IP or Spec-VP. Referential

subjects will only be possible in Spec-VP. Since Italian locates [+F] in I, a *pro* will be licensed in Spec-VP with I as its governor. In Icelandic, however, [+F] in C will be the governor for *pro*, so a *pro* in Spec-VP will not be governed. The only acceptable position for *pro* in Icelandic is Spec-IP.

Since Irish is a non-V/2 language like Italian and we assume that it locates [+F] in I, we may interpret the possibility of referential null subjects in Spec-VP as evidence for a nominal Agr in Irish. Irish does in fact allow and furthermore demand null referential subjects in certain environments, as documented in McCloskey & Hale (1984) and McCloskey (1986). The following example is taken from the latter.

- (7) Chuireadar \emptyset isteach ar an bpost.
 put-PAST-3pl in on the job
 'They applied for the job.'

The null argument is identified as *pro* governed by Agr. This analysis is consequent with the account of null subjects presented in P/H and exemplified by Italian.

Irish is not exactly the kind of null subject language that we normally find in languages like Italian or Spanish, however. Based upon the numerous peculiarities of Irish null subjects, Guilfoyle (1990) gives another analysis. She argues that the Irish null subjects should be identified as trace instead of *pro* and advocates an incorporation analysis instead of a *pro*-drop one. This incorporation analysis is equally consequent with the claims of P/H concerning Agr and finiteness, since it also assumes that it is I which governs the referential null argument in Spec-VP. As noted in 2.3, traces will only be licensed in the Spec-VP of a nominal Agr language.

Thus whether we maintain a *pro*-drop analysis or an incorporation analysis, the presence of null subjects in the Spec-VP of Irish seems to indicate the presence of a nominal Agr.

3.2 Oblique subjects

The absence of a nominal Agr in languages like Swedish places a greater burden upon the Spec-IP position: an overt nominative element must appear there to license the [+F] feature. In languages like Icelandic, where Agr is inherently nominal and can serve automatically as the licenser for [+F], the Spec-IP position is not required to contain any overt nominative element.

This predicts the possibility of oblique subjects in the Spec-IP of Agr languages but not \emptyset Agr languages. P/H exemplify the contrast as follows:

(8) Icelandic:

Hana vantar peninga.
 she-ACC lacks money-ACC
 'She lacks money.'

(9) Swedish:

***Henne** saknar pengar.
 she-ACC lacks money

The same test should be applicable to VSO languages with [+F] in I. A nominal Agr should license the [+F] in I and make the appearance of an overt nominative element in Spec-VP optional. If Irish has a nominal Agr, then we should find instances of oblique subjects in Irish.

Guilfoyle (1986) argues that there are several constructions in Irish in which a casemarked NP should be treated as an oblique subject. In many of these constructions, the oblique NP is actually a combination of a preposition and an NP. If the NP is pronominal, it will fuse morphologically with this preposition to form a 'prepositional pronoun' (Christian Bros. 1980) or an 'inflected preposition' (Stenson 1981). Guilfoyle treats these and unfused combinations of prepositions and nouns as quirky casemarked NP of the same type as those found in Icelandic. The first type of construction in which such oblique subjects may be said to occur is the modal:

(10) Is féidir (*sé) **liom** teach a cheannach.
 COP possible (it) with-me house buy(-fin)
 'I can buy a house.'

(11) B'éigean (*sé) **dó** teach a cheannach.
 COP must (it) to-him house buy(-fin)
 'He must buy a house.'

The modal is assumed to be base-generated in INFL. The inability of the pleonastic pronoun *sé* to appear in modal sentences is used as evidence for a monoclausal structure with the oblique NP occupying the subject position.

Oblique subjects might also be said to be found in Irish with the use of the copula *is* (present) and *ba* (past). In these copula constructions, the element which may be identified as the oblique subject is not a prepositional pronoun but a personal pronoun in accusative case. Traditionally such pronouns are known as 'subpredicates' (Stenson 1981).

(12) *Is/Ba lia é.*

COP surgeon he-ACC

He is/was a surgeon.

Guilfoyle explains the appearance of both kinds of oblique subjects by arguing that the modals and the copula 'override' Agr and prevent nominative case from being assigned to the subject NP by Agr as it normally would be in Irish. She argues that Agr is absent from these oblique subject constructions on the basis of several observations. First, the modals and copula show no person or number agreement, and such agreement is usually associated with the presence of Agr. Second, the modals and copula cannot appear in untensed clauses. Finally, an adverb may intrude between the oblique subject and the finite verb, a situation which is unacceptable in normal instances of Agr governing nominative case on the subject NP. If the adjacency requirement between the finite verb and the subject NP is only a prerequisite to the assignment of nominative case, then an oblique subject should be exempt from this requirement.

In light of the claims of P/H, however, these facts actually make a stronger argument for accepting the presence of a nominal Agr with the Irish copula and the modals. The correct interpretation should not be that these verbs override Agr; they are in fact more dependent upon its existence than other verbs in the language. With a nominal Agr in I, there is no need for an overt nominative to appear in Spec-VP to license [+F]. The failure of the verb to agree with these Irish oblique subjects exactly parallels the situation we find with the Icelandic oblique subjects: When there is no nominative NP in the clause, the finite verb is always in 3rd person singular. This is to be expected if it is really the abstract nominal Agr which is licensing [+F] instead of an overt subject in nominative case. The inability of the Irish modals and copula to appear in infinitives is straightforwardly explained if we assume that they are generated in INFL and that infinitives are probably instances of bare VP. The adverb intrusion may receive the same explanation as the one offered by Guilfoyle. Since the subject is no

longer dependent on an adjacent governing head for the assignment of nominative case, an adverb is free to appear.

3.3 Empty expletive subjects

The same factors which determine the possibility of oblique subjects also determine whether a language may have empty expletive subjects: In nominal Agr languages like Icelandic, there is no need for an expletive to appear in Spec-IP. In \emptyset Agr languages like Swedish, however, a nominative expletive will be required to license [+F]. Some examples are given to illustrate the contrast.

(13) Icelandic:

Rigndi (***það**) í gaer?
 rained it yesterday
 'Did it rain yesterday?'

(14) Swedish:

Regnade **det** (* \emptyset) igår?
 rained it yesterday

Attempts at constructing similar examples in Irish gave the following results:

(15) Bhí sé (* \emptyset) ag cur fearthainne inné.

be it at put rain yesterday
 'It rained yesterday.'

Example (15) seems to correspond to the \emptyset Agr pattern represented by the Modern Swedish example in (14). The expletive *sé* is always obligatory with weather expressions. However, there are also cases in Irish in which the expletive *sé* may be optional (16), and still others in which *sé* is obligatorily absent (17).

(16) Tá sé / \emptyset beartaithe againn [a dhul go Meiriceá.]

is it determined at-us go(-fin) to America
 'We have determined to go to America.'

- (17) Chuaigh (*s \acute{e}) \emptyset de sholas an lae.
 went of light the day-GEN
 'Daylight faded.'

The behavior of expletive subjects in Irish may not be straightforwardly dependent solely upon the character of Agr. It is important to remember the distinction between the position of expletive subjects in SVO languages and VSO languages: expletives appear in the Spec-IP position of SVO languages, a position which is never assigned a theta role. In Irish, however, an expletive would appear in the Spec-VP position, which is a typical theta position. The appearance of expletives there should not, however, be taken as an indication that it may serve as the target for A-movement (Guilfoyle 1990). In view of this difference, it is not surprising that the existing account of the distribution of expletive *s \acute{e}* in Irish is based on the assignment of theta roles and case (Travis 1984). Travis schematizes her proposal as follows:

- (18) a. *s \acute{e}* / * \emptyset theta \leftarrow VP
 b. *s \acute{e}* / \emptyset V \rightarrow theta
 c. **s \acute{e}* / \emptyset V \rightarrow theta, case

When the Spec-VP position is not assigned a theta role, it is thus possible and in some cases obligatory to have a null expletive. Although it is dependent on factors other than the nature of Agr alone, the fact that this option is available in Irish is a third indication of the presence of a nominal Agr of the type proposed by P/H.

3.4 Raising

In P/H, the possibility of nominative NP appearing in the Spec-VP of the infinitive part of a Raising construction is taken as evidence of a nominal Agr in Icelandic. This can only occur when the Spec-IP position of the main verb is filled with an oblique subject, as shown in the following example. The infinitive portion is analyzed as VP.

- (19) Hafði þér virst [VP e [VP Ólafur vera gáfuður?]
 Had you-DAT seemed Olaf-NOM to-be intelligent

The nominative in Spec-VP is only possible in such cases because of a T-chain linking the infinitive to the Agr of the matrix clause. This allows the infinitive verb to head govern the NP *Ólafur* and license it as an overt nominative. No such T-chain will be possible in the \emptyset Agr language Swedish. We might want to call this effect 'anti-Raising', since what it does is remove the necessity for Raising, which is an otherwise obligatory move. That underlying necessity is, of course, the requirement of case.

What bearing does this have on the situation we find in Irish? First, if we look at how the prototypical Raising verb *seem* is expressed in Irish, we find the following:

- (20) a. *Breathnaíonn sé* [*go bhfuil Éamon sásta.*]
 seem it that be E. satisfied
 'It seems that Eamon is satisfied.'
- b. **Breathnaíonn Éamon* [*e a bheith sásta.*]
 seem É to be satisfied
 'Eamon seems satisfied.'

Citing these examples, Stenson (1981) concludes that 'Raising rules of any kind are notably lacking from Irish' (p 74). The proposed raised NP is in boldface and its original position is marked by *e*. That claim has been a controversial one and has been challenged in several analyses. McCloskey (1984) introduces a type of Raising which is said to raise an NP from an embedded clause, but the landing site of this NP is not the subject or object position of the higher clause. Instead, the NP is raised to become object of a preposition. This type of Raising has been called 'Quirky Raising' or 'Exceptional Raising'. A typical example is given in (21).

- (21) *Ní thig le Ciarán* [*e a bheith i bhfad ar shiúl.*]
 NEG comes with C. be(-fin) far away
 'Ciarán can't be far away.'

Postal (1984) gives a similar analysis in a Relational Grammar framework. For a strictly GB-based analysis, Quirky Raising embodies a real threat to the Projection Principle. Maintaining such an analysis entails allowing verbs to be subcategorized for non-thematic inner arguments, a situation which finds no precedent in any other language besides Irish. However, two

solutions have been offered to this dilemma. We have already seen that Guilfoyle (1986) rejects the Raising analysis altogether and treats sequences like *le Ciarán* with modal verbs as oblique NP subjects rather than PP. Stowell (1989) takes a similar view in treating the relevant NP as inherently casemarked, but he defends the Raising analysis with the revision that the landing site is no longer a V'-internal position but the matrix subject position. The 'quirkiness' of this brand of Raising is now seen to stem from the inherent quirky case of the NP rather than from the position in which it comes to rest after the Raising has applied. We will continue to maintain Guilfoyle's analysis as the simpler of the two and to uphold the claim that there is no Raising to be found in Irish.

The bottom line seems to be that Irish is a language in which Raising is simply not necessary. If we look at other verbs which we might expect to qualify as Raising candidates, we find that they often take finite clause complements rather than infinitives, so the case requirement on the subject will always be met and Raising will be obviated. For instance:

- (22) *Is cosúil [go bhfuil siad sásta leis sin.]*
 COP like COMP be they satisfied with-it that
 'It seems that they are satisfied with that.'

Notice that English also has this type of 'lexicalized' anti-Raising in which Raising is avoided by allowing the verb to subcategorize for a finite clause rather than an infinitive one:

- (23) It seems [that Olaf is very intelligent.]

Irish also has the kind of syntactic anti-Raising that is identified by P/H for Icelandic. It is a well-known fact that Irish has some means of assigning default accusative case to the subjects of infinitives. This means is not yet understood, but it is accepted by Celtic syntacticians. There is, then, no motivation for raising the subject of an infinitive clause like the one in example (20b). In view of the predictions of P/H, it is tempting to attribute the default accusative on infinitive subjects to the presence of a nominal Agr. It does not explain, however, why these subjects appear in accusative case rather than in nominative, as in Icelandic. Perhaps this peculiarity in itself sheds some light upon the nature of Agr in Irish. We will consider infinitives and default accusative more in section 6.4. For the moment, it

suffices to say that the subject position of an infinitive clause in Irish does receive casemarking by some means so that an anti-Raising effect is produced. If P/H are correct, this may be interpreted as a sign of nominal Agr.

3.5 Heavy Subject Postposal

P/H find that Heavy Subject Postposal is acceptable in both Agr and \emptyset Agr languages if it is with ergative or intransitive verbs. Postposal will in these instances be from the nom-d position, within V', if we assume that even intransitive subjects are generated in the nom-d position. Support for this is the possibility of allowing the subject to remain in this position while an expletive fills the Spec-IP position, as is illustrated in this Swedish example:

- (24) Det ringde **en man**...
 'There called a man...'

Postposal with transitive verbs, however, will involve moving an NP from the Spec-VP position, so we should find that it is possible to case-license a trace there in Agr languages but not in \emptyset Agr languages. This is illustrated in the contrast below:

- (25) Icelandic:
 það munu [[e kaupa þessa bók] **marginir studentar**.]
 there will buy this book many students

- (26) Swedish:
 *Det skall [[e köpa den här boken] **många studenter**.]
 there will buy this book many students

Heavy Subject Postposal is attested for Irish, and it is sometimes used as a diagnostic for clausal status (McCloskey 1983, Stenson 1981, McCloskey 1985). However, examples may be found in which the postposed subject is not a clause and is not particularly heavy. Such examples are frequent in the Munster dialect (Ó'Siadhail 1989):

- (27) Tagann [[e chugham isteach] **an sagart paróiste**....]
 comes to-me inwards the priest parish
 'The parish priest comes in towards me...'

Although he cites no directly ungrammatical examples, Ó'Siadhail notes that subject postpositional seems to occur only following intransitive verbs of motion, appearance, or existence. Two such examples are also given in Chung & McCloskey (1987) and used as evidence that the subject position of a finite clause is properly governed. One is quoted here.

- (28) Tháinig *e* amach sa chaint [**an leithscéal fill** **a tugadh**
 came out in-the talk the excuse treachery-GEN REL was-given
don athair.]
 to-the father
 'The treacherous excuse that had been given to the father emerged
 in the talk.'

Chung and McCloskey obviously interpret the subjects of these intransitives as originating in the canonical subject position rather than in the V'-internal position where P/H place them. If we follow their account, then Heavy Subject Postpositional is another phenomenon which supports the existence of a nominal Agr head governing the subject position and licensing a trace there.

3.6 Summary

As can be seen from the evidence reviewed above, the syntactic predictions which P/H correlate with the presence of a nominal Agr are confirmed in Irish. An overt nominative subject is in Irish an optional rather than an obligatory element: Irish is at least to some extent a null subject language, expletive subjects may be optional, and oblique subjects can occur. In addition, overt subjects may occur in the Spec-VP position so that an anti-Raising effect is produced, and traces left by Heavy Subject Postpositional seem to be properly governed there.

All this is in several respects an echo of the data found in Chung & McCloskey (1987), where the same or similar tests lead to the conclusion that the subject position in Irish finite clauses is properly governed. P/H's parametric study places that conclusion in a wider perspective by showing how the same syntactic phenomena pattern in other languages and by attributing the source of these patterns to the nominal Agr vs. \emptyset Agr distinction. It is now possible to identify nominal Agr as the lexical governor of the Irish subject position. Although it is the feature [+F] which licenses the appearance of nominative case, Agr seems to be the actual governor assigning this case to the subject position in Irish. As we will

discuss in a moment, Agr acts as a governor in Irish even in the absence of [+F], and in these instances nominative is totally impossible. Thus [+F] appears to be the licenser of nominative case but not the assigner. In Irish finite clauses, [+F] licenses nominative case, and Agr is then free to bestow this case upon the subject NP. Alternatively, Agr can itself absorb the nominative case and allow the subject to remain null or oblique. This scenario suggests that Agr is a subordinate member of INFL possessing the power of government, but dependent upon [+F] to authorize its power to govern nominative. This subordination concept will be referred to again with respect to the interpretation of INFL in expanded-INFL syntax, but before that there is one last piece of evidence for nominal Agr which needs to be examined.

4.0 THE MORPHOLOGICAL EVIDENCE

P/H assume a very straightforward positive correlation between the presence of Agr and the presence of overt subject-verb agreement in a language. If there is any kind of overt subject-verb agreement, then the language has Agr; but if there is no agreement then there is no Agr. As expected, their example languages illustrate this perfectly: Icelandic verbs are inflected for both person and number in every tense, while Swedish verbs have no trace left of the person and number inflection of the kind still alive in Icelandic.

Even here, Irish presents us with a curious and seemingly contradictory set of data. A look at the inflectional paradigms of Irish verbs reveals a mixture of some forms showing person and number agreement known as *synthetic* forms and others which do not show any agreement morphology, known as *analytic* forms. The distribution of these two types is inconsequent, with varying percentages of both in different tenses. There are even certain verb paradigms for which there exist alternatives of both the synthetic and analytic type, and the choice is optional. McCloskey (1986) and McCloskey & Hale (1984) discuss the details of these alternations. What is important for this discussion is that Irish does have some form of overt subject-verb agreement, and therefore it must also have an Agr head in INFL following the system of P/H. The synthetic verb forms clearly must have an Agr head, even though the status of the analytic forms is not clear. Could it be possible that the status of Agr in Irish is variable? In other words, is it plausible to suggest that Agr is present in the case of the synthetic verb forms, but absent in the case of the analytic ones? This would

in essence make Agr a kind of optional category. It is a highly controversial suggestion indeed, but one that must be dealt with since we are trying to determine whether to include Agr or not in the syntax of Irish.

In Dooley Collberg (1989), the relatively impoverished inflectional paradigms of the Irish verbs was interpreted as a sign of an opaque Agr, or in the terms of P/H, a \emptyset Agr. There was also some doubt voiced there as to whether Irish should actually be classified as a *pro*-drop language. Now with the body of syntactic evidence reviewed in the preceding sections, it seems clear that Irish Agr is in fact transparent or nominal instead. We have already argued that Irish is a *pro*-drop language (section 3.1), and that the verbal paradigms are actually morphologically rich enough to support a null subject. This revision is based on the idea of Roberts (1990) that there can be two kinds of richness in verbal paradigms: *functional* richness and *formal* richness. A functionally rich paradigm allows at most one syncretism, while a formally rich one will accept any number of syncretisms, as long as the paradigm on the whole contains no zero endings. According to Roberts, a language in which the null subject is identified under government rather than by agreement requires only a formally rich verbal paradigm. He uses this statement to explain why null subjects continued to appear in Old French even after restructuring of the verbal paradigms involving syncretism. Since the proposed *pro* subject in Irish is identified by government, a formally rich paradigm should be sufficient. The verbal paradigms which were earlier identified as impoverished do conform to the definition of formal richness. This allows us to conclude that the syncretisms in no way indicate an absence of Agr, whether Agr is interpreted as a feature or as a syntactic category in its own right. It spares us from having to postulate an Agr whose presence or absence varies lexically depending on the properties of the finite verb. Instead, we may claim that the analytic verb forms in Irish still *formally* indicate the presence of an Agr feature, although it is one which is not *functionally* rich. There is thus subject-verb agreement in Irish, even if it is on a formal basis with some syncretised elements.

5.0 THE REALIZATION OF AGR IN EXPANDED-INFL SYNTAX

Already in Dooley Collberg (1990) an expanded-INFL syntax was proposed for Modern Irish in which Agr was included as a full categorial projection. The present study confirms that this structure was on the right track. The

results of accepting a nominal Agr in Irish allow us to further refine that structure, which we will turn our attention to now.

5.1 Expressing parametric variation

Pollock (1989) points out that one of the advantages of expanding INFL would be the ability to better express interlanguage variation. Such variation might be the result of several kinds of structural variation within the expanded INFL.

One source of variation might be in identifying which of the two phrasal projections is the head governing nominative case. An example of this kind of variation is exploited in Roberts (1990), where some languages are said to have Agr governing nominative and others Tense. Celtic, it is claimed, has the Tense option. Dooley Collberg (1990) places [+F] in Tense, and I will continue to locate it there. I will claim, however, that it is Agr which is the governing node in Irish for the subject position. Nevertheless, the feature [+F] will still be responsible for the appearance of nominative case on the subject. In the absence of [+F], Agr will govern a default accusative case. Evidence for this is the possibility of accusative subjects in infinitive clauses, as noted earlier in 3.4.

Roberts' account is reconcilable with the one which we defend here for Irish because it also involves a second source of possible variation in implementations of expanded-INFL syntax. The relative ordering of the Tense and Agr phrases may vary. Roberts assumes that it is AgrP which dominates TenseP, while Dooley Collberg proposed that TenseP was dominant for Irish. In the latter study, the finite verb was moved directly to Tense, since it was the location of [+F]. I will now assume that the finite verb moves first to Agr and consequently to Tense. This is one of the first consequences of assuming that Agr in Irish is nominal, as P/H claim. Endowing Agr with nominal features qualifies it as a governor, so head movement of the finite verb will necessarily be to Agr first if we are to respect the Head Movement Condition, which does not allow for 'skipping' governing heads. This proposal preserves the exact government configuration of Roberts, although it locates the governor of nominative in Agr now rather than in Tense, as our evidence has indicated. The two structures are given for comparison in Figure 3. The Tense dominant order was adopted in Dooley Collberg (1990) because of the ordering of certain preverbal particles and initial phonological mutations in Irish described in

incorporate her account into the context of an expanded-INFL syntax. The next sections examine two possible reinterpretations.

5.2 Spec-Agr interpreted as Spec-IP

In expanded-INFL syntax there are two candidates for being identified as the position which Guilfoyle and other syntacticians refer to as Spec-IP: Spec-Agr and Spec-TP. Both will be absent from a structure in which functional categories only project to the X' level, so we will not be able to choose between the two simply on consideration of Irish data alone. We will have to consider Swedish and Icelandic as well in light of their relationship to Irish.

Let us assume first that Spec-IP should be equated with Spec-Agr. This would make Spec-Agr the landing site for Raising and Passive. This interpretation is consequent with the Icelandic facts. Icelandic, having an Agr like Irish, but having a Spec-Agr as well unlike Irish, would be perfectly capable of countenancing Raising and Passive. This interpretation is not, however, defensible after considering Swedish. Swedish, lacking the Agr head completely, would necessarily also lack its specifier. On this structural point it would be on a par with Irish and the prediction would be that it, too, would lack Raising and Passive. As we have seen, Swedish does allow Raising and Passive. Spec-Agr should therefore not be interpreted as Spec-IP.

5.3 Spec-TP interpreted as Spec-IP

The remaining alternative is to let Spec-TP act as Spec-IP. This interpretation does prove to be consequent with the data of all three languages. Irish will be the only language lacking the Spec-TP position, thus correctly representing it as the only language of the three to show no np-movement. Irish and Icelandic will be similar in that they both contain a nominal Agr head, yet they will be different in that the Irish Agr will never have a specifier. Swedish and Icelandic will be similar in that they both allow Raising by virtue of the presence of Spec-TP, while they will differ on many points because of the absence of any Agr projection at all in Swedish. In short, the three languages exemplify very well how an expanded-INFL syntax may be implemented to reflect parametric structural variations underlying interlanguage variations. The three kinds of expanded-INFL syntax they embody are illustrated in Figures 4, 5, and 6.

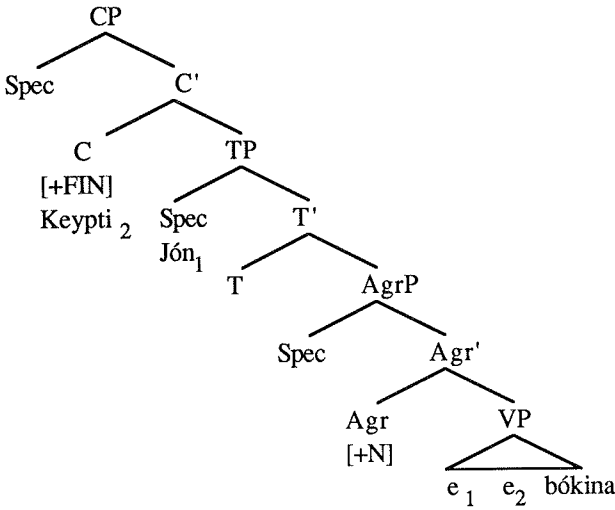


Figure 4. Expanded-INFL syntax for Icelandic. The finite verb moves to C, and the subject NP raises to Spec-CP or Spec-TP, as in the question *Keypti Jón bókina?* ('Did John buy the book?').

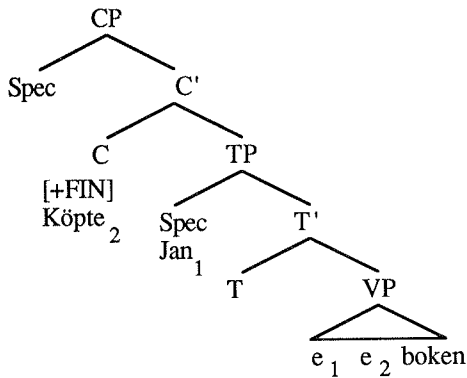


Figure 5. Expanded-INFL syntax for Swedish. The finite verb moves to C and the subject NP raises to Spec-TP in questions. There is no AgrP.

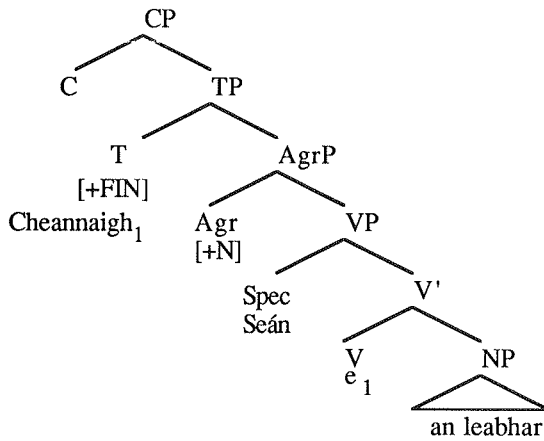


Figure 6. Expanded-INFL syntax for Irish. Functional projections are only projected to the X' level. The subject remains in Spec-VP, and the finite verb moves to T, giving the VSO order shown in the sentence 'Sean bought the book.'

Besides accommodating the present set of data nicely, there is independent support for assuming that Spec-TP may be Spec-IP. Choosing to accord Spec-TP the role of Spec-IP is in many ways tantamount to saying that Tense is the head of the expanded-INFL configuration, with Agr itself acting as either the specifier or complement to the Tense head, depending how we choose to order the two. This is perfectly consequent with the traditional concept of INFL. In Chomsky's (1986) remarks on INFL it was tense which entailed the presence of Agr, and not vice versa. Upholding the position argued for in P/H and in this paper, Tense may be said to be a universally present syntactic category, while Agr may or may not be present. All this points to the 'subordination' of Agr with respect to Tense.

6.0 IMPLICATIONS OF ASSUMING THAT AGR IS NOMINAL

Following P/H's characterization of Agr as an inherently nominal category entails consequences for how we should expect it to behave in Irish. We have already seen one of these consequences above in section 5.1, where it became necessary to identify Agr as the syntactic head governing nominative in order to respect relativized minimality. Some other implications are discussed briefly here.

6.1 Copula subpredicates: Evidence for Spec-Agr?

Previous sections have identified Spec-TP as the position which we should equate with the Spec-IP of other syntactic proposals which do not assume an expanded-INFL syntax. Further support for this equation comes from the implications of identifying Agr as an inherently nominal category. If Agr is truly nominal, then perhaps it does *not* behave as a functional category but as a lexical category instead. This would exempt it from the functional projection parameter introduced in 5.1 above and allow it to project to X". Even so, the presence of a possible Spec-Agr in Irish would in no way jeopardize our implementation of Guilfoyle's explanation for the lack of Raising in Irish. If Spec-TP is, as we maintain, the target for Raising and Passive, then Irish will still lack these constructions even if it contains a Spec-Agr.

This raises the question of whether there is evidence to support assuming a possible Spec-Agr for Irish and of what syntactic elements we might expect to find occupying this position. In Dooley Collberg (1990) it was suggested that the so-called 'subpredicate' pronouns found in Irish copula constructions might be analyzed as appearing in Spec-Agr. Examples from Stenson (1981) are quoted here for reference.

(29) Is í Cáit mo bhean.
 COP her C. my wife
 'Kate is my wife.'

(30) Is iad na Stáit Aontaithe an margadh is fearr.
 COP them the states united the market REL-COP best
 'The United States are the best market.'

These subpredicate pronouns are always accusative and always appear when the logical subject of the sentence is a definite NP. Their appearance is as yet unexplained, but we might want to identify them tentatively as expletives coindexed with both Agr and the logical subject of the sentence, which we assume to be generated within V'.

6.2 Clefting: Further evidence for Spec-Agr?

Since we have identified Spec-TP as the target for Raising and Passive, we should probably regard it as an A-position. It is most likely, then, that Spec-

Agr would be an A'-position. At least it should be, if we want to prevent it from being a possible target for Raising and Passive, which we have excluded from Irish. If Spec-Agr is indeed an A'-position, then we might expect to find evidence of some movement to this position. Clefting provides evidence of such a move. Irish allows liberally for clefting of a wide variety of syntactic categories introduced always by the copula. In each case, there is no identifiable finite verb in the main clause other than the copula itself. The remainder of the sentence is a headless relative clause. It should not be possible to head move entire phrases into the position of Agr itself, as was argued in Dooley Collberg (1990). A possible explanation for the clefting construction is thus that the clefted phrases have been moved into the Spec-Agr position. This analysis is shown in the examples below.

(31) Is [airgead] [atá ag teastáil uaim.]

Spec-Agr

COP money REL-be at lack-VN from-me

'It's money that I need.'

(32) Is í [mo dheirfiúr] [a chonaíonn in Sasana.]

Spec-Agr

COP her my sister REL live-REL in England

'It's my sister that lives in England.'

In certain cases such as (32), subpredicate pronouns still must appear with clefted phrases. Unfortunately, no explanation for this phenomenon can be offered at the present time other than that these subpredicates are instances of adjunction.

6.3 Overt Agr

P/H identify Agr itself as a position in which nominative is licensed by the [+F] feature. This position never seems to be filled with an overt element, however, at least not in the languages they have examined. There could be reason to think that it may be filled with an overt element in Irish, however. The evidence once again comes from copula constructions, where a bare noun or adjective seems to act as a predicate. Two examples are given here:

(33) Is **lia** (é) Seán.

COP surgeon (him) S.

'Sean is a surgeon.'

- (34) Is **deas** í an aimsir.
 COP nice it the weather
 The weather is nice.

In Dooley Collberg (1990) this bare noun was analyzed as being head moved up to Tense in order to lexicalize [+F]. Since we are now assuming that the copula itself resides in Tense and may serve to lexicalize the [+F] feature there, the bare noun predicate may actually remain in Agr. This would help to explain precisely why nouns and adjectives are allowed to function in this unusual way as predicates with the Irish copula. If they are actually surfacing in Agr, which is a [+N] node, then as [+N] syntactic categories they logically should be able to appear there. Additional support for this is the observation of Stenson (1981) that the adjectives which are typically allowed to function as predicates with the copula are best regarded as some kind of inherent nominalization. It is significant that these adjectives cannot appear with the substantive verb *tá* ('be') unless accompanied by the particle *go*, as illustrated below:

- (35) Tá an aimsir **go deas**.
 be the weather ADV nice
 'The weather is nice.'

According to Stenson, this particle is an adverbializer which acts to remove the inherent nominal quality of these adjectives so that they may appear in non-copulative constructions. Finally, notice that the subpredicate *é* in example (33) is optional. Perhaps this is an indication that the predicate noun may remain in Agr or may be moved to Tense anyway as all predicates would be.

6.4 Evidence for independent AgrP: infinitive phrases

If the nominal status of Agr in Irish allows it to be treated as a lexical category, we might also expect to find independent AgrP behaving in the manner of other more easily recognizable nominal categories. An immediate candidate for such an independent AgrP is the infinitive phrase, traditionally known as the verbal noun phrase. The traditional name for the phrase seems motivated given this analysis with nominal Agr. The infinitive phrase behaves much like a finite clausal complement, another phrasal

complement which also has a substantive quality in many languages besides Irish. The main difference between the two, of course, is the finiteness feature which is only associated with the finite clause. If we have been correct in placing [+F] in Tense, then the infinitive phrase in Irish should lack the TenseP. This much seems clear enough.

The lack of a TenseP is not alone sufficient, however, to justify an analysis of infinitive phrases as AgrP. Many current syntactic proposals, including P/H, treat infinitive phrases as bare VP. But the evidence for treating Irish infinitive phrases as AgrP comes from data presented in Chung & McCloskey (1987) and showing differences among Irish finite, nonfinite, and small clause subject positions with respect to government. Their data gives ample proof that the subject position of nonfinite clauses in Irish is properly governed from *within* the clause. This can be seen clearly in the following of their examples:

- (36) *Shíl siad [a **chéile** a bheith breoite.]
 think-PAST they each-other be-VN ill
 'They thought that each other was ill.'
- (37) Cé a b'fharr leat gan [*e* a bheith i láthair?]
 who COMP you-would-prefer NEG be-VN present
 'Who would you prefer not to be present?'
- (38) Cé a ba chiontach le é / *leis a bheith amuigh?
 who COMP COP guilty with him /with-3sg be-VN outside
 'Who was responsible for him being outside?'

The first example above illustrates that an anaphor (*a chéile*) cannot find its antecedent (*siad*) within the matrix clause. In other words, the binding domain for the subject of an Irish infinitive clause is the infinitive clause immediately containing it. Example (37) shows that the trace of wh-movement left in the subject position is properly governed from within the clause, since the negative *gan* will block any government from the matrix clause. Finally, (38) involves an infinitive clause as object of the preposition *le*. We would expect *le* to merge with the pronominal *é* subject of this clause as prepositions and pronouns are normally required to merge. But it does not, proving that *é* cannot be governed by an outside governor.

Chung & McCloskey conclude from this data that Irish nonfinite clauses must include INFL in their structure, and that INFL provides the internal governor for the subject position. We can now more precisely identify this internal governor as the Agr portion of INFL. Chung & McCloskey stress that proper government in Irish is a matter of lexical government solely and that antecedent government plays no part in Irish. If they are correct, then an Agr endowed with lexical qualities will qualify as a proper governor and explain the effects observed in the examples quoted above. It will also provide a simple explanation for the ability of Irish INFL, unlike English INFL, to function as a proper governor, a difference discussed in McCloskey (1990). In that article, McCloskey rejects eliminating INFL as a possible proper governor because of its functional rather than lexical status, but neither does he wish to stipulate simply that INFL may function as a proper governor in only some languages. By separating INFL into Tense and Agr projections and assuming that the lexical status of Agr may vary parametrically, it becomes possible to avoid such stipulations and to explain why Agr can sometimes properly govern subjects. It also makes it unnecessary to appeal to the notion of strong government (Rizzi 1990) as McCloskey does, even though it does seem to yield roughly the same result as the parametric account of lexical versus \emptyset Agr.

Example (38) is especially significant because it shows that infinitive clauses can appear as complements to prepositions, a position which is typically reserved for substantives. The Minimal Condition of Chomsky (1986), which requires that the nearest potential governor for a category exercise that government, predicts the failure of the otherwise expected prepositional merger here. If we assume an Agr governor intervening between the preposition and the subject of the infinitive, then Agr will be the nearest potential governor and prevent the preposition from governing into the clause as observed. Chung & McCloskey's structural proposal for the Irish infinitive can thus be translated into expanded-INFL terms as shown in Figure 7.

There is one final piece of evidence for analyzing Irish infinitives as independent AgrP. This is the default accusative case which appears on the overt subjects of infinitive phrases. As mentioned earlier, this default accusative has been problematic to explain. If we assume a nominal Agr governor heading the infinitive phrase, then there will always be a governor licensing the appearance of an overt subject. The fact that this subject appears in accusative case when it does appear may itself be a subtle

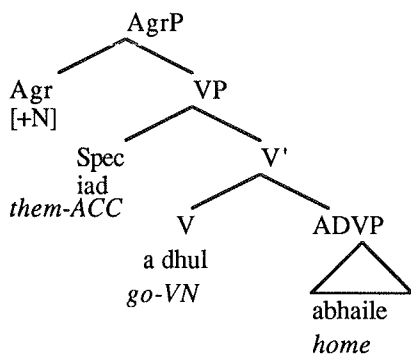


Figure 7. The Irish infinitive (verbal noun) clause analyzed as AgrP. In this example, the verbal noun clause is complement to a copula construction: *Ba mhaith liom [iad a dhul abhaile]*, ‘I would like [them to go home]’.

reflection of another aspect of the inherent character of Agr. Without the presence of the [+F] feature in Tense to authorize nominative case, Agr may simply surface in an inherent accusative form. P/H do not discuss the possibility of Agr itself being inherently anything other than nominative, but in view of the evidence from Irish this seems to be a possibility worth investigating.

Duffield (1990) argues that the leniting infinitive particle *a* may be an overt realization of the category Agr. This account, which he refers to as ‘Object Agreement’, is based on mutation facts and purports to explain how the objects of infinitives receive accusative case. The object NP is said to move into the specifier position of the AgrP headed by *a* and receive case by means of spec-head agreement. Although the account is in many ways attractive, it introduces an exception in that it would be the only instance of case assignment in Irish by spec-head agreement. All other instances have been argued here, following Chung & McCloskey (1987), to be the result of head government alone. Furthermore, the Object Agreement account does not offer any solution to the problem of how default accusative case is assigned to the subject of infinitive clauses. Since the focus of this study is the status of Agr and its influence on mainly subject positions, I will not consider the role of Object Agreement here but leave it instead for further research upon Irish infinitive clauses and the SOV word order found there.

7.0 CONCLUSIONS

The central goal of this research article has been to determine whether we should postulate the presence of a nominal Agr head in the syntax of Modern Irish. Using a group of diagnostic tests suggested by Platzack & Holmberg (1990) and forthcoming, evidence was found that there is a nominal Agr head in Irish. With this preliminary conclusion, it was possible to reconfirm the expanded-INFL syntax proposed for Irish in Dooley Collberg (1990) and further refine that structure by adopting ideas on functional projection from Guilfoyle (1990). The resulting syntactic structure which has been developed here is one which combines the detail of the expanded-INFL type syntax with the explanatory advantages of an Irish TenseP projected only to one level instead of two. It is descriptively accurate for describing the empirical data reviewed from Irish and is furthermore explanatorily attractive in the way it serves to illuminate the similarities and differences found among Irish, Swedish, and Icelandic when an expanded-INFL version of syntax is applied to all three. It provides support for accepting that Agr is inherently nominal by showing how this assumption may further illuminate some of the unsolved problems involving the Irish copula and the assignment of default accusative to the subjects of infinitive phrases. It reconfirms the subordinate relationship of Agr to Tense, and it predicts that Agr is indeed one of the prime areas of interlanguage variation, just as P/H claim. Most importantly, it embodies a successful extension of expanded-INFL syntax to express parametric variation, and serves as an indirect confirmation of this typologically oriented line of structural research.

On that note, I would like to conclude by reiterating the critical question of whether adopting the functionally parameterized syntax of Guilfoyle (1990) is truly reconcilable with an expanded-INFL syntax. My answer of course is a definite yes. It must be stressed that the most important aspect of expanded-INFL syntax is the treatment of Tense and Agr as categorial projections in their own right rather than simply as features. This entails that Tense and Agr should structurally have the same appearance as the other categorial projections of the language in question. Adopting a version of the parameters of functional projection in no way jeopardizes the implementation of this idea. On the contrary, it allows us to draft a structural proposal for Modern Irish in which AgrP and TenseP are expanded in exact accordance with the parameters of functional projection

for that language. That structure then enables us to properly place Irish in typological relation to others.

This confirms the basic idea behind the introduction of expanded-INFL syntax. The decision to promote Tense and Agr to the status of full projections is much like putting INFL under a microscope and increasing the power one more stage to give a sharper and more detailed image. By increasing the power of our analytic syntactic microscope, we are better able to examine and come to an understanding of the parametric variation among languages in INFL, the functional heart of the sentence.

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Comparative Studies in Current Syntactic Theories

Currently there are three leading syntactic theories recognized by most linguists: Government-Binding Theory (GB), Lexical-Functional Grammar (LFG), and Generalized Phrase Structure Grammar (GPSG). This thesis consists of five separate studies which compare the three theories with one another both on the formal theoretical level and on the level of application to actual syntactic data. The title study gives a short presentation of each theory from a historical and ideological perspective. On the basis of a number of observed parallels in notational convention, principles and restrictions, and analysis of specific constructions such as long-distance dependencies, it is then argued that each theory represents only one separate interpretation of the prevailing generative paradigm ruling the field of syntactic research today in the Kuhnian sense of normal science. The concept of the derivational device is introduced as the single most important feature of this modern syntactic theory, whether it be implemented in the form of a transformational rule (GB), a lexical rule (LFG), a metarule (GPSG), or feature instantiation principles (GPSG).

The remaining four studies contain applications of each theory to specific syntactic problems. 'Oblique Subjects in Icelandic Passive Constructions' exploits the lexical focus of LFG to describe the idiosyncratic casemarking on the subjects of certain verbs and to suggest a possible basis for the ongoing change in casemarking known as *þágufallssýki*. 'GPSG and the Verb-Second Phenomenon in Swedish' explores a feature-based account of the word order data usually analyzed by GB as verb movement. 'An Expanded-INFL Syntax for Modern Irish' proposes a GB structure using TenseP and AgrP which is supported by mutation data and the behavior of copula constructions. 'The Status of Agr in Modern Irish' refines this proposal by placing Irish Agr in typological perspective as a nominal category and the governor of overt accusative infinitive subjects.