

The main goal of this article is to develop a unitary representation for the phenomena that can occur in the domain between the binder and the bindee and that depend on the relation of syntactic binding. What I call *binder* and *bindee* have been called "filler", "displaced constituent", "extracted constituent" and "gap", "trace", "place of origin", respectively; what I call *syntactic binding* has been called "*wh*-movement", "unbounded movement and deletion", "extraction", or "unbounded dependency". Kaplan and Bresnan (1982), formalizing the framework in which I will treat these phenomena, call it "constituent control".

The italicized portion of the following sentence is a syntactic *binding domain*:

- (1) I wonder who *Bill said that Mary thought that John saw*.

In English, this domain is not marked morphologically or syntactically in any overt way; that is, the italicized strings of words in (1) and (2) are exactly the same, although in (1) the string constitutes a binding domain whereas in (2) it does not.

- (2) I think that *Bill said that Mary thought that John saw Mary*.

In other languages, however, formal differences do exist between the two sentence types. The first case discussed at length in the literature is French Stylistic Inversion (Kayne and Pollock (1978)). Other cases are Irish complementizer selection (McCloskey (1979)), Kikuyu downstep deletion (Clements (1979)), and the nonoccurrence of *það* insertion in Icelandic (Zaenen (1980)). In what follows I will develop a universal system of representation for such "syntactic binding domain phenomena". Such an account must explain the following generalizations:

A. Syntactic binding domain phenomena are not limited to cases of unbounded dependencies in which a successive cyclic movement analysis can be maintained. The studies of the phenomena in Irish and Kikuyu cited above argue that in these languages a movement analysis is inferior to a deletion analysis; Zaenen (1980, forthcoming) argues that in a transformational framework both movement and unbounded deletion must be allowed in Icelandic and that in both cases syntactic binding domain phenomena occur.

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In what follows I will give a nontransformational account that abstracts away from the difference between movement and deletion.

B. As I will argue, only complementizers and verbs are ever affected by being in a syntactic binding domain. An explanatory account will have to ensure that only these two elements *can* be affected.

C. Syntactic binding phenomena are insensitive to the internal functional characteristics of the binder; that is, the fact that the binder *who* in (1) is singular, inanimate, etc., is not relevant. Equally irrelevant is the fact that the bindee is the direct object. In the languages under consideration, *which students* in (3) would have exactly the same effect as *who* in (1):

- (3) I wonder which students Bill said that Mary thought that Bill gave the papers to.

In this respect these phenomena are different from raising-type constructions, for example, where intermediate agreement can be found. For instance, in the Icelandic sentence (4), the past participle *talín* agrees with *María*, just as *sögð* does.

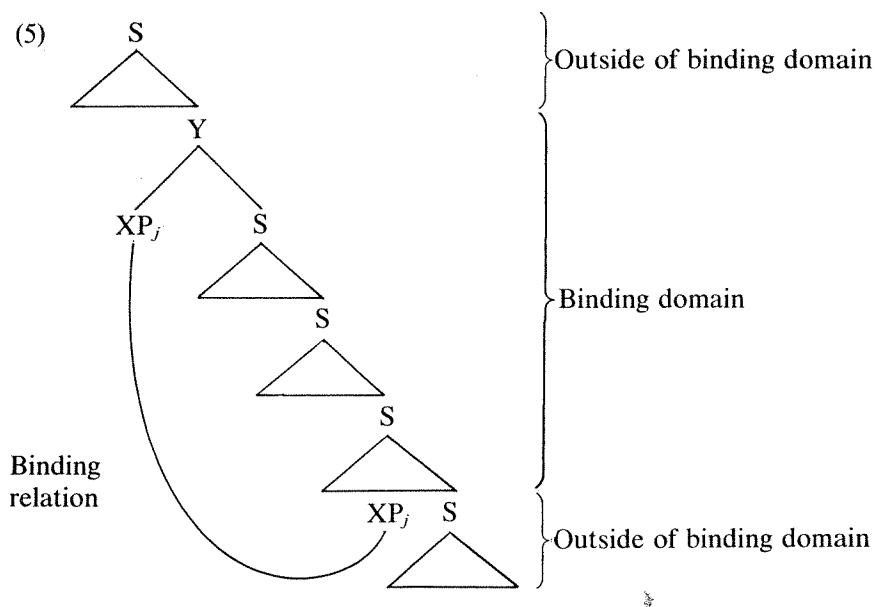
- (4) *María* er *sögð* vera *talín* hafa skrifað ritgerðina.  
 Mary is said (N fem) to be believed (N fem) to have written the thesis

In what follows I will assume that (A) has been established sufficiently in the papers cited. In sections 1 and 2 I will establish (B) for some simple cases (Irish and Kikuyu) and develop an account from which (B) and (C) follow naturally. In section 3 I will extend the account to less obvious cases (French and Icelandic). Section 4 contains a general discussion and some predictions made by the approach advocated here.

## 1. The Data: Binding Domain Phenomena

As a preliminary definition of *binding domain*, I offer one derived from Clements (1979): a binding domain consists of all the clauses dominating a bindee and not dominating the binder.<sup>1</sup> Diagram (5) illustrates this:

<sup>1</sup> I have adapted the terminology. In Clements's own terminology, an *open sentence* is defined as "a clause dominating an anaphoric element bound by an obligatory rule of grammar to an antecedent which the clause does not dominate."



In this section I will illustrate some phenomena that characterize this domain in different languages and extract the primitives that seem to be necessary to describe them.

### 1.1. Irish Complementizer Selection

Irish relative clauses and questions are treated in detail in McCloskey (1979). The facts of interest here are the following: in the “direct relative” (the one containing a gap),<sup>2</sup> the binding domain contains a complementizer different from the one that normally introduces *that*-clauses. I follow McCloskey (1979) in the transcription of the various complementizers (the capital letters indicate lenition or nasalization of the following segment). (6) gives an example of a simple declarative with an embedded *that*-clause; (7) gives the shape of the complementizer when the clause is part of a relative.

- (6) Deir siad goN síleann an t-athair goN bpósfaidh Síle  
 say they that thinks the father that will marry Sheila  
 é. (= McCloskey's (45))  
 him  
 ‘They say that the father thinks Sheila will marry him.’

<sup>2</sup> The indirect relative in Irish, i.e. one containing a resumptive pronoun, is not treated in the system sketched below. It is not clear that this type of relative should be treated as a case of syntactic binding in the sense used here; the way the linking equations work implies that “connectivity” phenomena hold between the binder and the bound position if the binder is assigned an independent function. This may or may not be the case when the bindee is a resumptive pronoun (for a language where it is the case, see Zaenen, Engdahl, and Maling (1981)). In Irish it has not been shown that the “binding” of resumptive pronouns obeys such a pattern.

- (7) an fear aL deir siad aL shíleann an t-athair aL phósfaidh  
 the man that say they that thinks the father that will marry  
 Síle (= McCloskey's (46))  
 Sheila  
 'the man that they say the father thinks Sheila will marry'

(6) is a normal declarative clause in Irish, which is a VSO language; (7) is a normal direct relative. Whereas in (6) the complementizer (translated as *that*) is *goN*, in (7) it is *aL*. This change is not optional but obligatory. McCloskey gives several arguments that this *aL* is a complementizer and not a *wh*-word. He also shows that *aL* appears only within the binding domain and not "lower" in the sentence. (8) illustrates this contrast:

- (8) a. an fear aL shíl goN mbeadh sé ann (= McCloskey's (4a), p. 151)  
 the man that said that would be he there  
 'the man that said that he would be there'  
 b. \*an fear aL shíl aL bheadh sé ann

In certain dialects the appearance of *aL* can be accompanied by the choice of a special verb form:

- (9) an t-iascaire aL dhiolas a bhád (= McCloskey's (12a))  
 the fisherman that sells his boat

This special form is optional; the "normal" form of the verb can also occur, as in (10):

- (10) an t-iascaire aL dhíolann a bhád (= McCloskey's (12b))  
 the fisherman that sells his boat

The same phenomena are found in Irish questions but, as McCloskey shows convincingly that questions and relatives have basically the same syntactic structure in Irish, this is not surprising. They are, however, also found in comparatives and clefts, two different constructions involving binding. As the data given in McCloskey (1979) are not extensive, I will not illustrate this here but accept McCloskey's conclusion that the complementizer alternation is dependent on the binding and that the optional verb alternation is dependent on the choice of complementizer. Thus, we see that in Irish the complementizer and the verb are affected in a binding domain.

### 1.2. Kikuyu Downstep Deletion

Clements (1979) reports an extremely interesting phenomenon in Kikuyu, a Bantu language spoken in Kenya. It has SVO word order and a very complex tonal system, parts of which are described in Clements and Ford (1979). One of the tonal phenomena that interacts with the syntax is the downstep associated with verbs. In affirmative declarative sentences, each verb has a downstep associated with it (represented as <sup>1</sup>). Because of the complicated tone rules of the language, this downstep influences the tone of the following words. First it skips over the first following phrasal category and then over

an immediately following sequence of low tones, turning them into high tones; therefore, if the shifted downstep is followed by low tones, they will become high as long as they were initially all adjacent to each other (that is, not interrupted by any underlying high tones or by another downstep). This process is illustrated in (11) (high tones are indicated by ´ and downstep by ˆ; low tones are unmarked; SP = subject prefix; PT = past tense):

- (11) Kamaú é:ˈríré    Ka:náké áte    Káriók'í átemíré    móťé.  
 Kamaú SP-tell-PT Kanake    that Kariūki    SP-cut-PT tree  
 'Kamaú told Kanake that Kariūki cut the tree.'

The underlying forms for *ate* and *Karioki* are as follows:

- (12) ate  
 Karioki

The downstep associated with *e:riré* shifts over *Ka:naké*, since that is the first phrasal category following the verb, and then turns the low tones of (12) into high tones, as shown in (11). The shifted downstep appears internally on the word *Karioki*. In the embedded clause the ˈ associated with the verb shifts across the following object to the end of the sentence, blocking the operation of a rule of final high tone lowering that would otherwise lower the low-high rising tone of *mote* (indicated by ˘) to low. These tone rules apply with all verbs. In questions, focus constructions, and relatives, however, a different situation exists. I illustrate it here with one example; more can be found in Clements et al. (1983). In (13), a *wh*-question parallel to the declarative (11), the tonal pattern is different (RELSP = relative subject prefix):

- (13) Nóo    Kamaú é:ˈríré    Ka:náké áte    otemíré    mote?˘<sup>3</sup>  
 FOC-WH Kamaú SP-tell-PT Kanake    that RELSP-cut-PT tree  
 'Who did Kamaú tell Kanake that cut the tree?'

The second tone on *ate* is now low, as it is in underlying form (the first one becomes high by an independent rule that spreads the high tone of *Kanake* onto the following syllable). Also, *mote* now ends in a low tone. Both facts are explained if we assume that the downstep on both verbs has been deleted: the low tones on *ate* and *otemíré* are just the underlying tones, and the underlying high tone on *mote* is lowered by the independent rule that lowers clause-final high tones. If the downstep on the lowest verb were still there, it would prevent this lowering because the high tone would not really be final but actually followed by the (inaudible) downstep.

What is the domain in which this downstep deletion applies? For certain speakers it is clearly the binding domain, as the following contrasts show:

- (14) [s' nóo    [s Kamaú é:ˈríré    [s' ate [s Karioki át'émíré    motê]]]]  
 FOC-WH    Kamaú SP-tell-PT    that    Kariūki SP-cut-PT tree  
 'Who did Kamaú tell that Kariūki cut the tree?'

<sup>3</sup> Note the alternation in noun class prefix when the subject is bound. It is not clear to me how this has to be accounted for.

Here the bindee is in the higher clause and the downstep on the verb of that clause is deleted, as can be seen from the low tones on *ate* and *Karioki*; but the downstep in the lower clause has not been deleted, as shown by the fact that *mote* keeps its high tone (to be compared to the low tone in (13)).<sup>4</sup>

Another contrast illustrating the same phenomenon and involving the focus construction is shown in (15a) vs. (15b), both of which translate as (15c):

- (15) a. [s' né mbére ya mote o:riá [s Ngóge oígíre [s' áte  
           FOC front of tree this Ngūgī SP-say-PT that  
           [s Kamaú ó:'niré Ka:nake]]]]  
           Kamau SP-see-PT Kanake
- b. [s' né mbére ya mote o:riá [s Ngóge oígíre [s' áte  
           FOC front of tree this Ngūgī SP-say-PT that  
           [s Kamaú ó:'niré Ka:náké]]]]  
           Kamau SP-see-PT Kanake
- c. 'In front of that tree Ngūgī said that Kamau saw Kanake.'

However, whereas this translation is ambiguous—either the saying or the seeing can have taken place in front of the tree—the Kikuyu sentence is not: (15a) means that Kamau saw Kanake in front of the tree, whereas (15b) means that Ngūgī said it in front of the tree. This is as expected: in (15a) the downstep of both verbs has been deleted, as shown by the low tone on *ate* and *Kamaú* (underlying form: *Kamaú'*) and the final low tones on *Kanake*. In (15b) only the downstep in the highest clause has been deleted, as shown by the final high tone on *Kanake*, indicating the presence of a sentence-final downstep that blocks the tone lowering rule.<sup>5</sup>

Unfortunately, the data are not as clear for all speakers. Whereas the contrast between (13) and (14) is general for all informants, the contrast between (15a) and (15b) is not, and some speakers consider both sentences to be ambiguous, like the English translation. When a speaker can make a distinction, however, it is consistently the one illustrated above; several structurally similar examples give the same results.

Those speakers who find (15a) and (15b) ambiguous still distinguish between binding domains and nonbinding domains: the deletion of the downstep is obligatory in the binding domain but optional in the lower clauses.

Thus, in Kikuyu we see again that the form of the verb is affected in a binding domain.

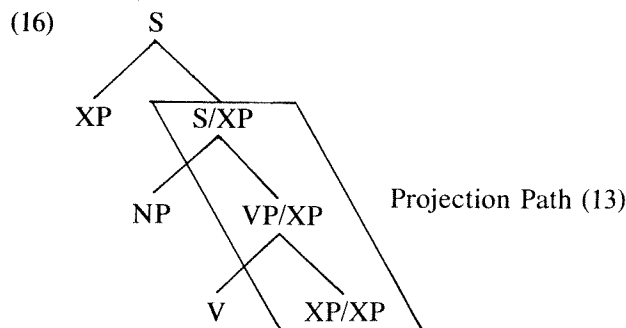
### 1.3. A Comparison

However different the phenomena may be in the two languages described, only certain constituents are affected: verbs and the Comp. In no case is the subject or the object

<sup>4</sup> The falling tone on the last word (indicated by ~) is due to question intonation.

<sup>5</sup> Note that in Kikuyu, the element affected is not adjacent to the complementizer. Hence, in a *wh*-movement type of analysis, the rule that deletes downstep could not be stated as a purely local rule (involving adjacent terms). It has to allow for the intervening subject (or one has to use a mechanism like the one described in section 2).

of the clause or any intermediate constituent affected. Notice that the facts in Kikuyu show clearly that what is at issue is *not* the *projection path* (as defined in Gazdar (1982)); the projection path is the chain of “slashed categories” that leads from the binder to the bindee, as illustrated in (16).



In example (13), repeated here for convenience, this projection path does not include the verb of the embedded clause, since it is the subject that is bound.

- (13) Nóo Kámaú é:'ríré Ka:náké áte otemíré mote?  
 'Who did Kamau tell Kanake that cut the tree?'

Nevertheless, downstep deletion has occurred.

## 2. A Lexical-Functional Analysis of the Data

I will assume that the binder-bindee dependencies illustrated in the previous section are all instances of “syntactic binding” or constituent control as defined in Kaplan and Bresnan (1982) and that the binder bears no grammatical relation to the intervening predicates. Ideally this should be argued for each case in detail. I have not done this here, however, but state the assumption on intuitive grounds. The dependencies in the languages discussed behave very much like English unbounded dependencies with respect to what factors can influence the binding relation. The grammaticality status of these sentences (in the relevant aspects) seems to depend on the node configurations in constituent structure; in these languages we find “island constraints” that, although different from those of English, can be described in terms of tree configurations.<sup>6</sup>

### 2.1. Relevant Aspects of Lexical-Functional Grammar

Before analyzing the facts presented above, I will briefly review the characteristics of lexical-functional grammar (LFG) that I will use in my account. In LFG, phrase structure

<sup>6</sup> Note that I do not make the assumption that these cases are cases of syntactic binding on the basis of the function of the constructions, i.e. the fact that they are used to express relativization or focus/topic, etc. In Zaenen (forthcoming) I will discuss a type of relative clause in Dzamba and Lingala that seems to be a case of functional control rather than of syntactic binding.

rules (PSRs) are annotated with information about the grammatical function the constituents have in the expansion of the rule. This is accomplished by the functional equations (f-equations) illustrated in (17):

$$(17) \quad S \rightarrow \quad NP \quad \quad VP \\
\quad \quad (\uparrow \text{ SUBJ}) = \downarrow \quad \quad \uparrow = \downarrow$$

The equations here convey that the NP to the right of the arrow is the subject of its mother node, S, and that all the information about the VP is also information about the S in functional structure.

The following principles govern the association between functions or features and categories of different levels:

A. *Maximal Category Convention.* Only *maximal projections* (i.e. phrasal categories and S) have *substantive functional equations* associated with them. Substantive functional equations have the format  $(\uparrow G) = \downarrow$ , where G is, for instance, SUBJ or OBJ.  $\uparrow = \downarrow$  is not a substantive equation. That this requirement is plausible can be seen by considering, for example, so-called subcategorization requirements. In LFG, it is assumed that lexical items subcategorize for certain functions, not for categories (Grimshaw (1982b) discusses the predictions this assumption makes), but in configurational languages it is always the maximal projection that will bear the relevant function; for example, in no language does a verb require an N or N' but not an NP as a subject.

B. *Head Convention.* The *head* of a major category (where a major category is a lexical category that has projections, or one of these projections) *always* carries the equation  $\uparrow = \downarrow$ . This is often assumed in X-bar theory but not always spelled out; a similar assumption is made in generalized phrase structure grammar (see Gazdar, Pullum, and Sag (1980)). As it is such a generally accepted assumption, I will not discuss it further.

C. *Minor Category Convention.* *Minor categories* (i.e. those without projections) do not have substantive features; but like the heads of major categories they carry the  $\uparrow = \downarrow$  equation and hence transmit the functional information encoded in the lexical items that they dominate.

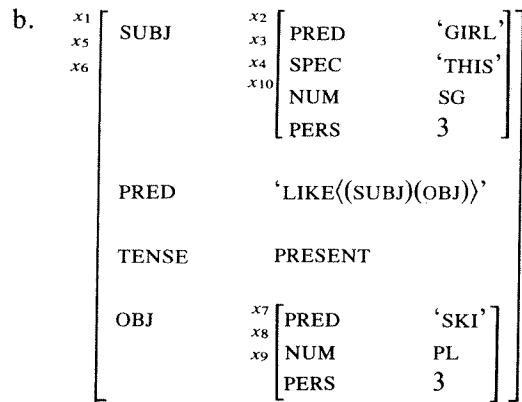
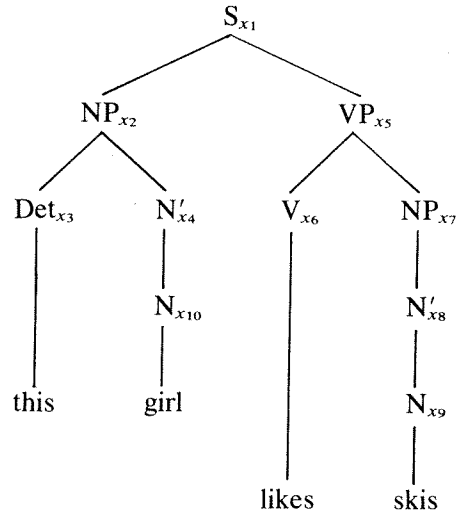
D. *Inflectional Feature Constraint.* Inflectional features are *always* introduced at the lexical level. Here I will only consider the case of inflectional features in the traditional sense that are properties of lexical items and hence belong to the lexical entry, such as the marking *-ed* on English verbs that induces the feature  $(\uparrow \text{ TENSE}) = \text{PAST}$  in the lexical entry of a verb. For example, the morphologically derived lexical entry of *liked* would contain the following information:

$$(18) \quad \textit{liked}: \quad V, \quad (\uparrow \text{ PRED}) = \text{'LIKE}((\text{SUBJ})(\text{OBJ}))\text{'}, \\
\quad \quad \quad (\uparrow \text{ TENSE}) = \text{PAST}$$

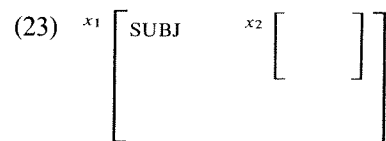


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(22) a.



The c-structure nodes and the f-structure units have been indexed so that the relation between both levels of representation can be made more precise. The f-structure is derived from the c-structure by instantiating the f-equation at each node; for example, the annotation  $(\uparrow \text{SUBJ}) = \downarrow$  in rule (21a) applied to the tree in (22a) gives the following partial f-structure, where  $x_1$  refers to the f-structure of the mother node S and  $x_2$  to the f-structure of the daughter node NP.



The annotation  $\uparrow = \downarrow$  of the VP in (21a) indicates that  $x_5$  is identical to  $x_1$ . In the notation developed in Kaplan and Bresnan (1982):

$$(24) \begin{matrix} x_1 \\ x_5 \end{matrix} \left[ \begin{array}{c} \\ \\ \end{array} \right]$$

(For an explicit statement of the algorithm illustrated here, see Kaplan and Bresnan (1982).)

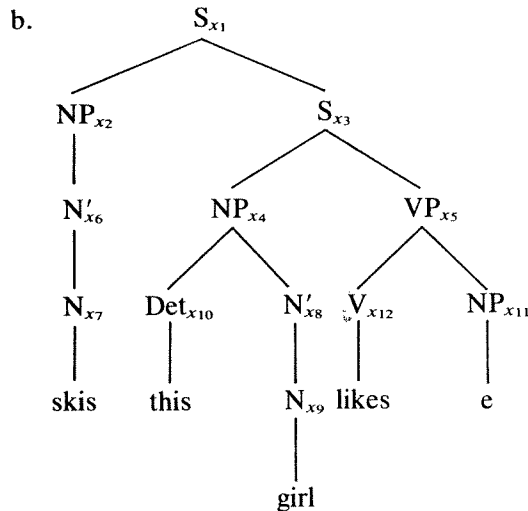
Both f-equations just discussed hold in (22b). In fact, this f-structure satisfies all the equations derivable from (21) and the lexical entries in (20); hence, it is an acceptable f-structure.

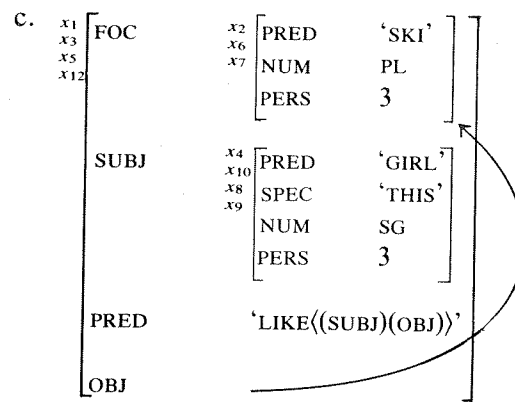
In LFG, syntactic binding or constituent control is effected through the instantiation of another set of equations, the *linking equations*. These employ the new variables  $\uparrow$  and  $\Downarrow$ , whose use is illustrated in (25):

$$(25) \begin{array}{l} S \rightarrow \begin{array}{cc} XP & S \\ (\uparrow \text{ FOC}) = \downarrow & \uparrow = \downarrow \\ \downarrow = \Downarrow \end{array} \\ XP \rightarrow \begin{array}{c} e \\ \uparrow = \uparrow \end{array} \end{array}$$

The binding effected by the  $\uparrow$  and  $\Downarrow$  metavariables is not strictly local like the binding effected by  $\uparrow$  and  $\downarrow$ . If no further constraints are imposed, the presence of a  $\Downarrow$  indicates that the variable at the node carrying the  $\Downarrow$  must be set equal to a variable at a node carrying a  $\uparrow$  somewhere in the domain c-commanded by the node carrying the  $\Downarrow$  (the *binder*, in LFG terms). The topicalized version of the simple sentence (19), namely (26a), will illustrate this. The c-structure of (26a) in accord with (25) is (26b), and the f-structure is (26c).

(26) a. Skis, this girl likes.



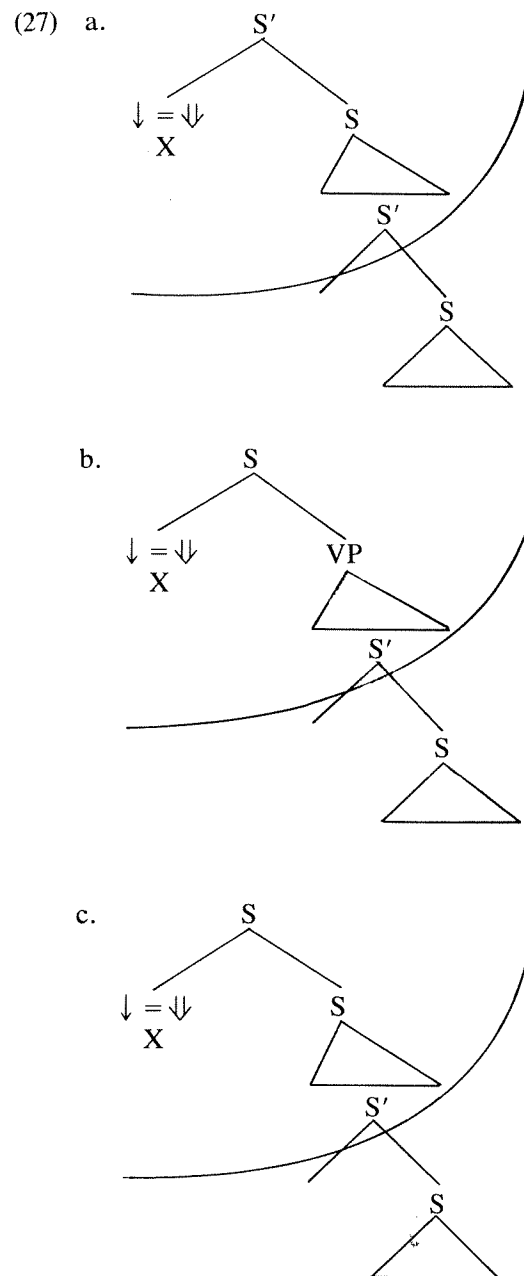


The arrow in (26c) indicates that the FOC and OBJ functions have the same f-structure ( $x_2 = x_6 = x_7$ ) as their value.

As discussed in Kaplan and Bresnan (1982) and in Zaenen (1980), the domain in which the instantiation of metavariables can occur must be constrained. A first constraint is that the binder must c-command the bindee. (I would like to state a stronger constraint: only a sentential category can be the right sister of a binder. There seem, however, to be exceptions to this stronger version: *tough*-constructions in English and topicalization in Makua as described in Stucky (1980). A weaker, more adequate constraint might be that only a projection of V can be the right sister of a binder.)

Further, I will assume that all S-nodes are bounding nodes (i.e. "boxed" in the Kaplan and Bresnan notation) unless stipulated otherwise.<sup>7</sup> This assumption was made in Zaenen (1980) to account for island constraints. I will not repeat that discussion here; it suffices to illustrate what is meant. The assumption is that the simple (noncompound) clause (i.e. S) is the unmarked binding domain. When a  $\Downarrow$  equation is introduced as the left sister of a node, it must normally find its  $\Uparrow$  in the domain c-commanded by the node carrying the  $\Downarrow$  and *not* including any S-node except one that is the sister of the node carrying the  $\Downarrow$  equation. Assuming that  $\Downarrow$  is always introduced as the left sister of a projection of V, the following relevant theoretical possibilities exist, where only the portion above the curve is accessible to the  $\Downarrow$ .

<sup>7</sup> I assume that only S-nodes can be bounding nodes and that the prohibitions against binding into, for example, PP or NP domains have to be accounted for in another way. Zaenen (1980) gives some (admittedly circumstantial) evidence for that point of view. See also Rothstein (1981).



Ss can be made accessible for binders by PSRs that introduce  $\uparrow = \downarrow$  equations that link two subjacent binding domains. For instance, English has the following rule:

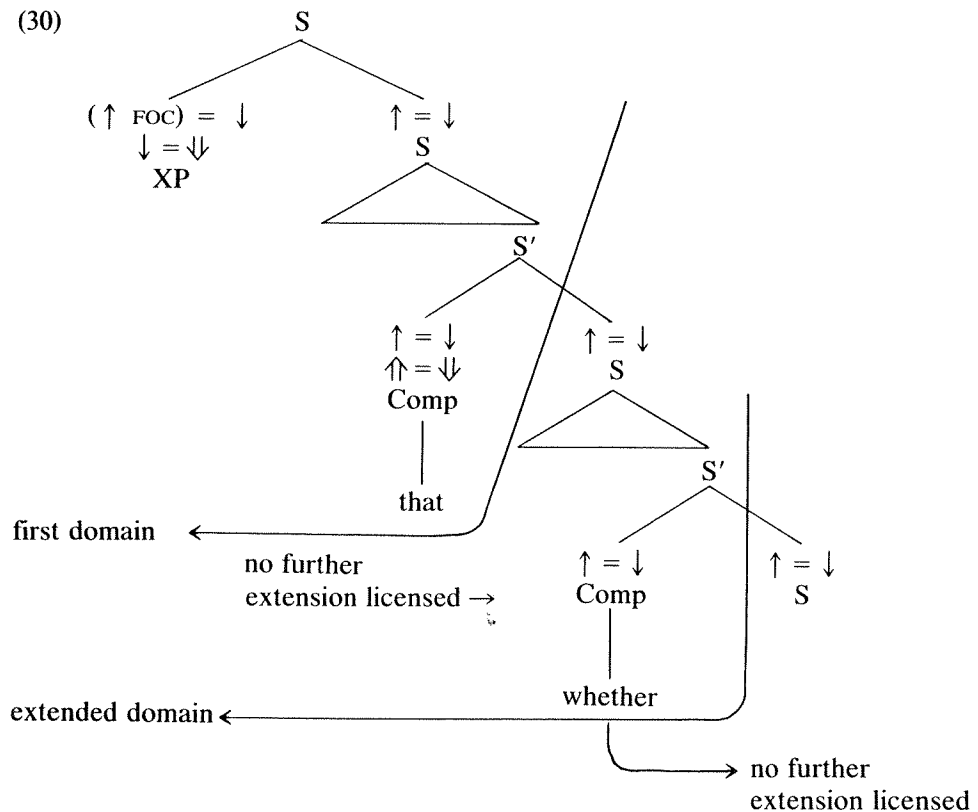
$$(28) \quad S \rightarrow \text{Comp} \quad S$$

$$\left( \begin{array}{c} \uparrow = \downarrow \\ \left\{ \begin{array}{c} \uparrow = \downarrow \\ (\downarrow Q) =_c - \end{array} \right\} \end{array} \right) \uparrow = \downarrow$$

This rule assumes the following featural analysis of the complementizers *that* and *whether*:

$$(29) \quad \text{that:} \quad \text{Comp}, \quad \begin{bmatrix} -Q \\ +\text{FIN} \end{bmatrix} \quad \text{whether:} \quad \text{Comp}, \quad \begin{bmatrix} +Q \\ +/\text{-FIN} \end{bmatrix}$$

The constraining equation  $(\downarrow Q) =_c -$  asserts that the Comp must have the feature  $-Q$ . Hence, the  $\uparrow = \downarrow$  equation on the Comp will be restricted to cases in which the inserted complementizer is  $[-Q]$ ; for dialects that allow extraction out of *whether* clauses, the constraining equation on (28) is omitted. By (28) the binding domain is extended to the S-domain immediately dominated by the S-node that is the right sister of the linking equation. Assuming a topicalization structure, the binding domain is as diagrammed in (30).

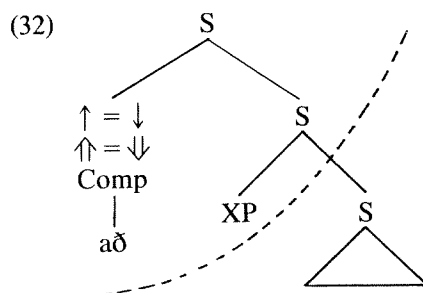


Embedded questions, in contrast, are introduced by the following rule (irrelevant details omitted):

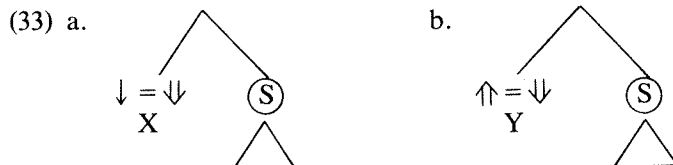
$$(31) \quad S \rightarrow \begin{array}{c} \text{XP} \\ [+wh] \\ (\uparrow \text{ FOC}) = \downarrow \\ \downarrow = \downarrow\downarrow \end{array} \quad \begin{array}{c} S \\ \uparrow = \downarrow \end{array}$$

No  $\downarrow\downarrow = \uparrow$  appears on the *wh*-word; hence, the binding domain is not extended further down, and as a result binding into an embedded question is not possible in English. In other languages a rule otherwise similar to (31) might have a  $\downarrow\downarrow = \uparrow$  associated with it and hence allow for binding within embedded questions.

Note also that “the binding domain ends at the next S-node down” means quite literally that. In the following configuration the binding domain is indicated by a dotted line:



I will also appeal to the notion of *root node*. For a definition I refer the reader to Kaplan and Bresnan (1982). Here it is sufficient to point out that the notion of root node as defined there treats the circled S in both cases in (33) as a root node.



Intuitively: a root S is an S that is the right sister of a node marked with  $\downarrow\downarrow$ . (Other cases are allowed; see Kaplan and Bresnan (1982).) For present purposes the generalization just stated is sufficient. Note that this notion is *not* related to the notion *root sentence* developed in Emonds (1976).

The discussion also requires the notion of *constraining equations*, an example of which has already appeared in (28). Constraining equations, distinguished from other types by a subscripted *c* ( $=_c$ ), express a condition that must be satisfied by a functional structure: constraining equations are used not to construct functional structures but to impose conditions on them.

With these notions that were developed to account for island constraints (among other things), let us turn back to the data described in section 1.

## 2.2. *Representing the Facts in LFG*

It is clear that with respect to the facts described in section 2, the system of syntactic representation summarized in section 2.1 is deficient in one aspect: it has no mechanism for transmitting to the V-node the information that an S is within a binding domain.

This problem can be solved by introducing a universal feature<sup>8</sup> that I will represent as BND (for "bound"). Nodes can thus be marked as  $(\uparrow \text{ BND}) = +/ -$ . This feature is locally transmitted in the way formalized in Kaplan and Bresnan (1982) and summarized in section 2.1. This means that the information is transmitted from the head of a category marked with the feature to the projections of that category, as well as to the mother node of the category node bearing the equation  $(\uparrow \text{ BND}) = +/ -$ .

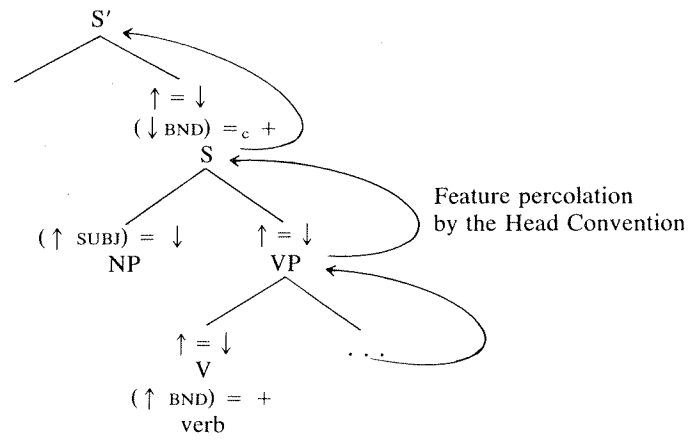
I will further hypothesize that the BND feature is part of the set of *inflectional features* that organize the mode and tense system of clauses. It is a natural assumption that  $+/-$  tensed,  $+/-$  subjunctive, etc., are properties of clauses. The inflectional markings of these properties, however, show up on the verb and/or the complementizer (exactly like the syntactic binding domain phenomena). The system proposed here explains this. On the one hand, inflectional markers must be introduced at the lexical level (i.e. in the lexicon or with a lexical category in a PSR); on the other hand, the information about this inflection must be constrained at the clausal level. It follows immediately that the features of this set can only be associated with either the Comp (or another minor lexical category, left sister of a sentential category) or the verb (or a minor lexical category immediately dominated by the VP or the V'; Aux, for instance). In no other way can a feature associated with the lexical level as defined be percolated up to "agree" with the S. Consider what would happen if the feature  $+ \text{ BND}$  were introduced on N. By the Head Convention, it would percolate up to the NP-level, but there it would be stuck. The Major Category Convention associates a substantive function with NPs but does not allow for the percolation of "internal" features. Thus, the appearance of this feature could not be constrained at the S-level.

(34a,b) illustrate the two cases of successful percolation and (34c) an unsuccessful one. For the sake of convenience, functional information is annotated to the tree representation (see Kaplan and Bresnan (1982) for the notational conventions used here). Universally, Ss that are root nodes will carry the constraining equation  $+ \text{ BND}$  and non-root Ss the constraining equation  $- \text{ BND}$ , unless explicitly specified as  $+ \text{ BND}$  in a language-specific PSR. This assumption about the levels at which the BND feature is constrained is the substantive part of my proposal. It is motivated by considering the type of dependencies that can be found universally. One can speculate why this is so. It might be possible to derive it further from semantic requirements; this is clear for features

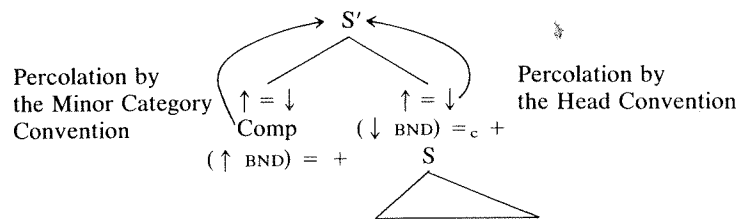
<sup>8</sup> Following Grimshaw (1982b, fn. 7), I will distinguish between features and functions and assume that features range only over certain fixed values whereas functions take variable predicates.



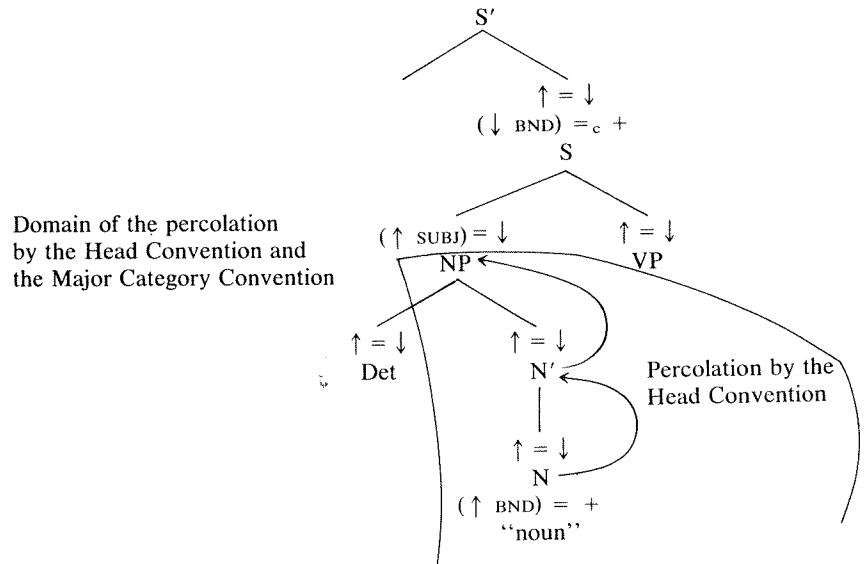
(34) a.



b.



c.



with information about tense that have a similar distribution. The information they carry has to be available at the clausal level, since tense operators act on propositions. It is not so clear that the constraints on the BND feature can ultimately be motivated semantically. One syntactic reason why a constraint on the clausal level seems natural is that, as stated above, the constraint will depend on the S being a root S or not. Information about whether or not a clause is a root S is of course not available within NP, AP, or PP in the sentence.

I will now illustrate how this proposal handles the facts discussed in section 1.

2.2.1. *Irish*. Following the above discussion, I will assume that the Irish complementizers *goN* and *aL* have the following partial lexical entries:

- (35) *aL*: Comp, ( $\uparrow$  BND) = +  
*goN*: Comp, ( $\uparrow$  BND) = -

The special forms of the verb that only occur in binding domains have the following sort of lexical entry:

- (36) *dhiolas*: V, ( $\uparrow$  PRED) = 'SELL((SUBJ)(OBJ))'  
 ( $\uparrow$  BND) = +

I will now illustrate how the system works for the relative clause given in (9), repeated here:

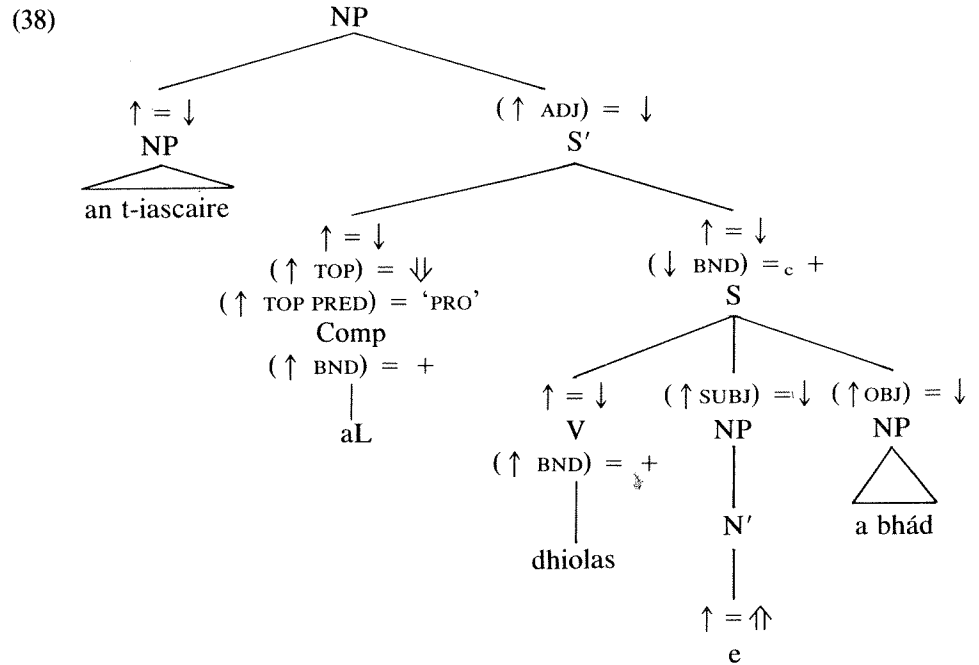
- (9) an t-iascaire aL dhiolas a bhád  
 the fisherman that sells his boat

I assume the following PSRs, adapted from McCloskey (1979):

- (37) a.  $S' \rightarrow$   $\begin{array}{ccc} & \text{Comp} & S \\ & \uparrow = \downarrow & \uparrow = \downarrow \\ & \left\{ \begin{array}{l} (\uparrow \text{ TOP}) = \downarrow \\ (\uparrow \text{ TOP}) = \text{'PRO'} \end{array} \right\} & \\ \text{b. } S \rightarrow & \begin{array}{cc} V & NP \\ \uparrow = \downarrow & (\uparrow \text{ SUBJ}) = \downarrow \quad (\uparrow \text{ OBJ}) = \downarrow \end{array} & NP \\ \text{c. } NP \rightarrow & \left\{ \begin{array}{cc} NP & S' \\ \uparrow = \downarrow & (\uparrow \text{ ADJ}) = \downarrow \\ \text{Det} & N \\ \uparrow = \downarrow & \uparrow = \downarrow \\ e & \\ \uparrow = \downarrow & \end{array} \right\} & \\ \text{d. } N \rightarrow & N & \\ & \uparrow = \downarrow & \end{array}$

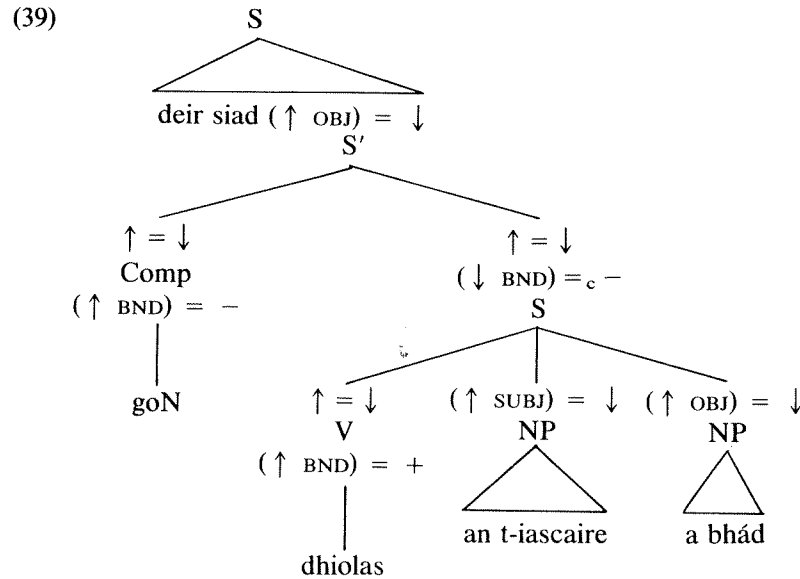
The first expansion in (37c) gives the general schema for relative clauses. In LFG, it is assumed that relative clauses are a kind of *adjunct*; in the *that*-type of relative (which, McCloskey argues, is the type found in Irish) an abstract pronominal element is anaphorically linked to the head noun. These assumptions are irrelevant here, but they

determine the exact shape of rules (37a,c). For discussion, see Zaenen (1980) and Bresnan (1982). The c-structure for (9)—annotated with functional schemata—is as follows:



In this example, the only value introduced for BND is +; since that is also the value required by the constraining equation, the sentence is well formed.

The following example, however, is ill formed:



Here the value of the BND feature of the verb clashes with that of the complementizer and with the constraint on the S, leading to ungrammaticality.

In (38), *aL* serves as a relative clause introducer. But the examples in section 1.1 show that the same complementizer also shows up with complement clauses in the binding domain (see (7)). Those cases require an expansion of S' in which Comp carries a functional annotation different from the one in (38):

$$(40) \quad S' \rightarrow \text{Comp} \quad S$$

$$\begin{array}{ccccc} \uparrow & = & \downarrow & \uparrow & = & \downarrow \\ \uparrow\uparrow & = & \downarrow\downarrow & & & \end{array}$$

By previous assumptions, the constraining equation ( $\uparrow \text{ BND}$ ) = <sub>c</sub> + attaches to S when it is the root node of a control domain; hence, the S in (40) will receive this specification. Insertion of the Comp *aL* will satisfy the constraint; *goN* will not. Of course, the following expansion also must be allowed for complement clauses that are not in a syntactic binding domain:

$$(41) \quad S' \rightarrow \text{Comp} \quad S$$

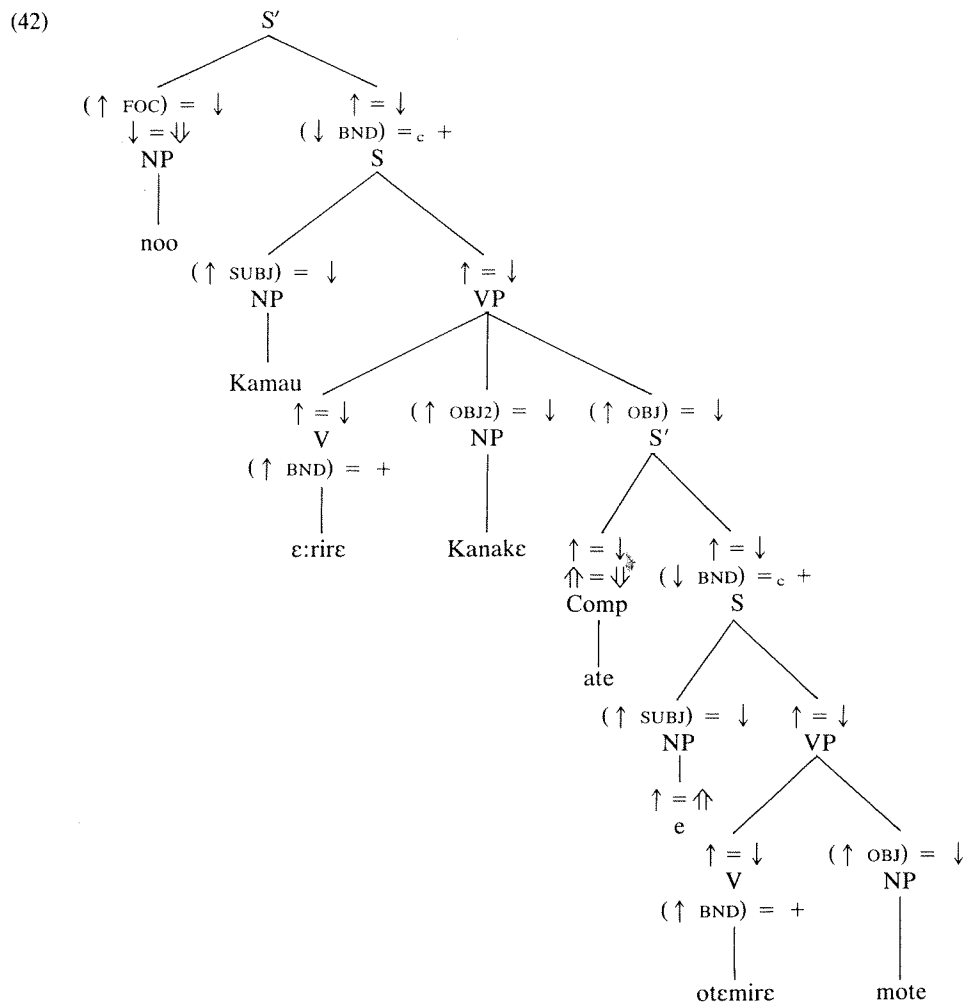
$$\begin{array}{ccccc} \uparrow & = & \downarrow & \uparrow & = & \downarrow \end{array}$$

As the reader can verify, only this case will allow *goN* to show up; in the two other cases the S is a root S of a control domain and hence, by universal convention, equipped with a +BND constraining equation.

**2.2.2. Kikuyu Downstep Deletion.** In Kikuyu I again assume the existence of lexical rules stating that verbal forms with downstep are ( $\uparrow \text{ BND}$ ) = - and that they are related by a lexical rule to verbal forms that have no downstep, which are marked ( $\uparrow \text{ BND}$ ) = +. Contrary to the Irish case, there are no Kikuyu verbal forms that are not specified for +/− BND because the downstepped form is obligatory in nonbinding domains and the form without downstep is obligatory in binding domains.

Given these assumptions, the c-structure of the Kikuyu example (13), repeated here, is (42):

- (13) Nóo      Kámaú é:ríré      Ka:náké áte otemíré      mote?  
 FOC-WH Kamau SP-tell-PT Kanake    that RELSP-cut tree  
 'Who did Kamau tell Kanake that cut the tree?'



As discussed in section 1.2, the downstep is deleted for both verbs in this sentence; hence, according to the rules proposed, both are marked +BND. However, both Ss are also root nodes of control domains, since they occur to the right of  $\downarrow$ s. Therefore, they are constrained to be +BND, and the sentence is grammatical.

### 3. An Extension of the Account

This straightforward treatment of the facts about Irish and Kikuyu binding domains raises the possibility of extending it to other languages in which the binding domain is affected. The two other cases I know of are French Stylistic Inversion and Icelandic *það* suppression. I will first summarize the facts concerning these two languages and then show how my analysis can be extended to them, given an extended notion of inflectional feature.

### 3.1. Binding Domain Phenomena in French and Icelandic

3.1.1. *French Stylistic Inversion.* French word order is in general SVO, in main as well as in embedded sentences:

- (43) J'ai dit à Marie que Pierre a rencontré Suzanne au coin de la rue.  
I said to Mary that Peter met Susan at the corner of the street

In main and embedded *wh*-questions, however, the subject can end up after the verb:<sup>9</sup>

- (44) a. Quand partira ton ami? (= K&P's (1a))  
when will leave your friend  
'When will your friend leave?'  
b. Je me demande quand partira ton ami. (= K&P's (2a))  
I me ask when will leave your friend  
'I wonder when your friend will leave.'

This phenomenon of Stylistic Inversion (SI) is discussed at length in Kayne and Pollock (1978) (henceforth K&P). Inversion is not limited to questions, but is also found in relatives (45) and, although K&P do not give examples, in other constructions that exhibit unbounded dependencies, e.g. in clefts (46):

- (45) La maison où habite cet homme est très jolie. (= K&P's (3a))  
the house where lives this man is very pretty  
'The house in which this man lives is very pretty.'  
(46) C'est avec cet homme-là qu'est sortie Marie.  
it is with this man there that is gone out Mary  
'It is with that man that Mary left/went out.'

But SI cannot be found in direct or indirect yes/no questions or in embedded indicative clauses, as the ungrammaticality of the following examples shows:

- (47) \*Partira ton ami? (= K&P's (4a))  
will leave your friend  
'Will your friend leave?'  
(48) \*Je me demande si partira ton ami. (= K&P's (5a))<sup>10</sup>  
I me ask if will leave your friend  
'I wonder if your friend will leave.'  
(49) \*Je sais que partira ton ami.  
I know that will leave your friend  
'I know that your friend will leave.'

<sup>9</sup> Stylistic Inversion is not the only type of subject-verb reordering in French. See Kayne (1975) and Grimshaw (1982a) for discussion of other types and Kayne (1972) for a characterization of Stylistic Inversion. Note that in Stylistic Inversion the subject does not have to follow the tensed verb immediately, although in general it follows only verbal elements. The examples marked K&P are from Kayne and Pollock (1978).

<sup>10</sup> The example shows that in French *si* is not a *wh*-word in Kayne and Pollock's treatment; in mine it shows that nothing is bound by *si*. In Icelandic *hvort* 'whether' clauses behave like clauses introduced by other *wh*-words.

The inversion is optional; the noninverted counterparts of all the previous examples are grammatical.

As K&P demonstrate and the contrast between (50) and (51) shows, SI can apply not only in the clause immediately introduced by a *wh*-word or a relative marker but also in a further embedded position, provided that the clause in which the inversion occurs is within the binding domain.

(50) Avec qui croit-elle qu'a soupe Marie?

with whom thinks she that has eaten Mary

'With whom does she think that Mary has eaten?'

(51) \*La femme qui croit que pleure Paul s'appelle Anne. (= K&P's (16b))

the woman who thinks that cries Paul is called Anne

'The woman who thinks that Paul cries is called Anne.'

In (50) *a soupe Marie* is within the binding domain. In (51) *pleure Paul* is not, as the relative binds the subject of the higher clause. Hence the contrast in grammaticality. Accordingly, (52a) is ambiguous but (52b) is not:

(52) a. Quand Marie a-t-elle déclaré que Paul était mort?

when Mary has she declared that Paul was dead

'When did Mary declare that Paul died?' (that is, when did she declare it or when did he die)

b. Quand Marie a-t-elle déclaré qu'était mort Paul?

when Mary has she declared that was dead Paul

(only the second reading)

K&P also attempt to show that SI can apply in clauses that are within the binding domain but are not the "lowest" clause (i.e. the one containing the bindee). Their data here are fuzzy. I will assume that their generalization is correct and that sentences like (53) and (54) are bona fide examples of SI that are not totally acceptable for independent reasons.<sup>11</sup>

(53) ?Avec qui a prétendu Marie que sortirait Jean?

with whom has claimed Mary that will go out John

'With whom did Mary claim that John will go out?'

(54) ?Les filles avec qui prétend que sort son mari la pauvre

the girls with whom claims that goes out her husband the poor

femme dont je viens de te parler sont toutes là. (= K&P (33))

woman of whom I have just told you are all here

'The girls who the poor woman I have just told you about claims that her husband goes out with are all here.'

<sup>11</sup> One of the reasons might be that this inversion is better with intransitive verbs, as is *il* inversion (see Kayne (1972)).

Under these assumptions, French SI takes place in clauses that are within a "binding domain", as defined earlier.

3.1.2. *Icelandic það Insertion.* The dummy element *það* occurs in Icelandic in several constructions. Here I will limit my attention to two of them: *impersonal passives* and a kind of *there* insertion that I will call *indefinite subject extraposition*. (I have not checked these data for the other cases.) The constructions are exemplified in (55) and (56), respectively:

- (55) *Það var dansað í gær.*  
 there was danced yesterday  
 'They danced yesterday.'
- (56) *Það drekka margir vín á Íslandi.*  
 there drink many wine in Iceland  
 'Many people drink wine in Iceland.'

As (56) shows, the "*there* insertion" construction in Icelandic is much more general than in English; it can occur with transitive verbs as well as with intransitives, provided that the subject is indefinite.

As discussed in Maling and Zaenen (1981) *það* can only occur if nothing else precedes the tensed part of the verb, and in that case it is obligatory both in main and in embedded clauses. The following examples illustrate this.

- (57) \**Í gær það var dansað.*  
 yesterday there was danced
- (58) \**Á Íslandi það drekka margir vín.*  
 in Iceland there drink many wine
- (59) *Hann sagði að, það drekki margir vín á Íslandi.*  
 he said that there drink many (people) wine in Iceland  
 'He said many people drink wine in Iceland.'
- \**Hann sagði að, drekki margir vín á Íslandi.*  
 \**Hann sagði að, á Íslandi drekki margir vín.*

The result of *það* insertion in Icelandic is that in declarative main clauses and embedded clauses the tensed part of the verb is always in second position, as discussed in Maling and Zaenen (1981). There is, however, one exception to this generalization not mentioned in Maling and Zaenen (1981) but discussed in Zaenen (1980); namely, in binding domains *það* must be omitted. The verb then can come first under the S-node in these domains if the subject is indefinite or if the sentence contains an impersonal passive.<sup>12</sup>

- (60) *Hann spurði, hvar væri dansað.*  
 he asked where was danced  
 'He asked where people danced.'

<sup>12</sup> Note also that the tensed verb does not have to be first in that context; participles and adjectives can also fill the first position. See Maling (1981) for discussion. This "inversion" can also occur in the cases discussed below.



- (61) Hann spurði, hvað drekki margt fólk á Íslandi.  
       he asked what drink many people in Iceland  
       'He asked what many people drink in Iceland.'  
 (62) \*Hann spurði, hvar það væri dansað.  
 (63) \*Hann spurði, hvað það drekki margt fólk á Íslandi.

Again this pattern is found not only in questions but also in relatives and in sentences with topics. For relevant examples, see Zaenen (1980).

The following examples show that *það* is impossible not only in the clause containing the bindee but also in the intermediate clauses:

- (64) Vodka veit ég að er talið að drekki margt fólk á Íslandi.  
       vodka know I that is said that drink many people in Iceland  
       'I know it is said that many people in Iceland drink vodka.'  
 (65) a. \*Vodka veit ég að það er talið að drekki margt fólk á Íslandi.<sup>13</sup>  
       b. \*Vodka veit ég að það er talið að það drekki margt fólk á Íslandi.  
       c. Ég veit að það er talið að það drekki margt fólk vodka á Íslandi.

In (64), topicalization has occurred out of the lowest clause. The intermediate clause contains an impersonal passive, and *það* insertion has not applied; the sentence is grammatical but the parallel (65a), in which *það* has been inserted in the intermediate clause, and (65b), in which *það* has been inserted in both clauses within the binding domain, are ungrammatical. (65c), however, is grammatical because it is not an instance of syntactic binding. Thus, we see that *það* insertion cannot occur in the binding domain.

That the phenomenon is limited to the binding domain is shown by the following contrast:

- (66) \*Í Rússlandi sagði hann að drekka margir vodka á Íslandi.  
       in Russia said he that drink many vodka in Iceland  
       'In Russia he said that many people drink vodka in Iceland.'  
 (67) Í Rússlandi sagði hann að það drekka margir vodka á Íslandi.  
       in Russia said he that there drink many vodka in Iceland

In (66) and (67), Russia indicates the place where he said that many people drink vodka in Iceland; hence, the embedded clause is not in the extraction domain and *það* has to be inserted. Thus, in Icelandic, *það* insertion is affected by the existence of a binding domain.

### 3.2. Extending the Analysis

At first glance, French and Icelandic do not fall within the proposed generalization that only verbs and complementizers can be affected in a syntactic binding domain. Note,

<sup>13</sup> The inversion seen in the highest clause here is *not* a case of the indefinite subject extraposition discussed here, as can be seen from the fact that the subject is clearly definite. I will not treat Icelandic word order constraints in general in this article. See Maling and Zaenen (1981; in preparation) for discussion.

however, that there is a simple way to generalize over complementizers and Icelandic *það*. They are all left sisters of a sentential category under the assumption that *það* is introduced by the following PSR, supported on independent grounds in Zaenen (1980):

$$(68) S \rightarrow \text{það } S$$

In French what is affected is the word order, and at first it is not clear how this has to be encoded. In the following subsection I will show that an analysis parallel to that of Irish and Kikuyu can be given for French and Icelandic. The only necessary change is an extension of the notion of *inflectional feature*, allowing PSRs to introduce inflectional features. However, I maintain the constraint that inflectional features can be introduced with *lexical* categories only. Thus, a PSR like (69) will be permitted, but one like (70) will be excluded:

$$\begin{array}{lcl} (69) & VP \rightarrow & \begin{array}{cc} V & NP \\ (\uparrow \text{MODE}) = \text{irrealis} & (\uparrow \text{SUBJ}) = \downarrow \end{array} \\ (70) & S \rightarrow & \begin{array}{cc} VP & NP \\ (\uparrow \text{MODE}) = \text{irrealis} & (\uparrow \text{SUBJ}) = \downarrow \end{array} \end{array}$$

3.2.1. *French Stylistic Inversion.* For French I will assume the following annotated PSRs:

$$\begin{array}{lcl} (71) & S \rightarrow & \begin{array}{ccc} (NP) & & VP \\ (\uparrow \text{SUBJ}) = \downarrow & & \uparrow = \downarrow \\ VP \rightarrow & \begin{array}{ccc} V & X & NP \\ (\uparrow \text{BND}) = + & & (\uparrow \text{SUBJ}) = \downarrow \end{array} & Y \end{array} \end{array}$$

Again, the given expansion of VP will only combine with an S that is constrained to be +BND. Note that (71) allows the PSR for French to be expanded in such a way that sentences with double subjects are possible. French has no such sentences, nor does any other language to my knowledge.<sup>14</sup> In LFG they are ruled out by the principle of functional consistency, which requires every grammatical feature of each grammatical unit to have a unique value. If an expansion of PSR (71) were chosen that would give two values for SUBJ, the resulting f-structure would be filtered out by the consistency requirement (for further discussion, see Grimshaw (1982a) and Kaplan and Bresnan (1982)).

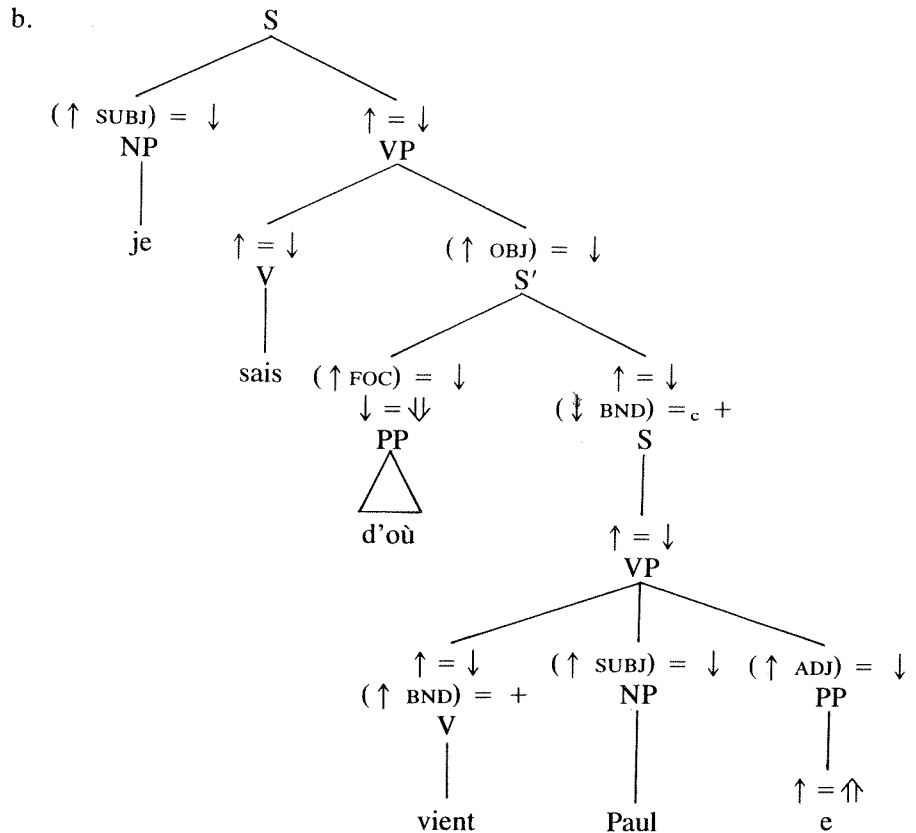
The variables in the expansion of VP are an expression of ignorance; the exact surface structure of sentences with SI has not been worked out. Kayne (1972) gives the fullest discussion in generative terms. The only property essential to my proposal is that the V and the subject NP be sisters at some level.<sup>15</sup>

<sup>14</sup> There are some languages that have been analyzed as having double subjects (see e.g. Heath (1977) on Choctaw). I assume that further study will show that the right analysis does not necessitate double subjects (see Davies (1981) for an account of Choctaw that does not assume double subjects).

<sup>15</sup> In a left-branching verbal complex as proposed in Emonds (1978) this would be rather difficult to obtain. There are, however, compelling arguments against Emonds (1978); see Zagona (1980).

(72a,b) illustrate this system:

- (72) a. Je sais d'où vient Paul.  
I know where from comes Paul  
'I know where Paul comes from.'



In this sentence the S is a root node of a control domain and hence constrained to be +BND. Since the verb is also +BND, the sentence is grammatical.

Other PSRs introduce Vs that are not specified for the function BND; they can occur in both bound and nonbound sentences. This immediately explains the optionality of inversion.

3.2.2. *Icelandic það*. Unfortunately, the analysis of the Icelandic data does not follow from the assumptions made so far without some language-specific stipulations. The PSRs that generate impersonal passives and indefinite subject extraposition sentences must on the one hand combine with *það* and on the other hand be able to apply in binding domains, but they cannot occur in both environments at the same time. Within the framework that I have developed here and in Zaenen (1980), there is only one way to

ensure this; namely, by assuming *það* is introduced by a PSR that also stipulates that the right sister S of *það* is a +BND sentence. This PSR is given in (73):

$$(73) \quad S \rightarrow \begin{array}{c} \text{það} \quad S \\ (\uparrow \text{ BND}) =_c + \end{array}$$

This rule does not associate a linking equation with *það*, ensuring that this S cannot be the root of a binding domain. It nevertheless characterizes it as a +BND sentence to allow for the following rule introducing impersonal passives and indefinite subject sentences. (I represent what follows the verb here with X in order to leave open the question of the exact c-structure that should be assigned to impersonal passives and indefinite subject sentences in Icelandic.)

$$(74) \quad S \rightarrow \begin{array}{c} V \quad X \\ (\uparrow \text{ BND}) = + \end{array}$$

Although this looks ad hoc, it is intuitively not unsatisfactory; what the dummy actually does is to allow for the sentence type in which nothing is topicalized,<sup>16</sup> not even the subject that in general acts as a discourse topic by default. Hence, the dummy acts as a contentless topic. Unfortunately, *það* cannot be equipped with a binding equation because it doesn't really bind anything, so the LFG formalism does not treat *það* as a topic. The sentence type that combines with it is, however, the sentence type that normally combines with topics; this is captured by characterizing that type in both cases as being +BND.<sup>17</sup>

In Icelandic this system will work through the interaction between the principles explained in section 2.2 and some of the assumptions made about binding nodes in section 2.1. The following examples illustrate this interaction. First the ungrammatical example (62), repeated here for convenience.

$$(62) \quad \begin{array}{l} *Hann spurði, hvar \quad \text{það} \quad \text{væri dansað.} \\ \text{he} \quad \text{asked} \quad \text{where there was} \quad \text{danced} \end{array}$$

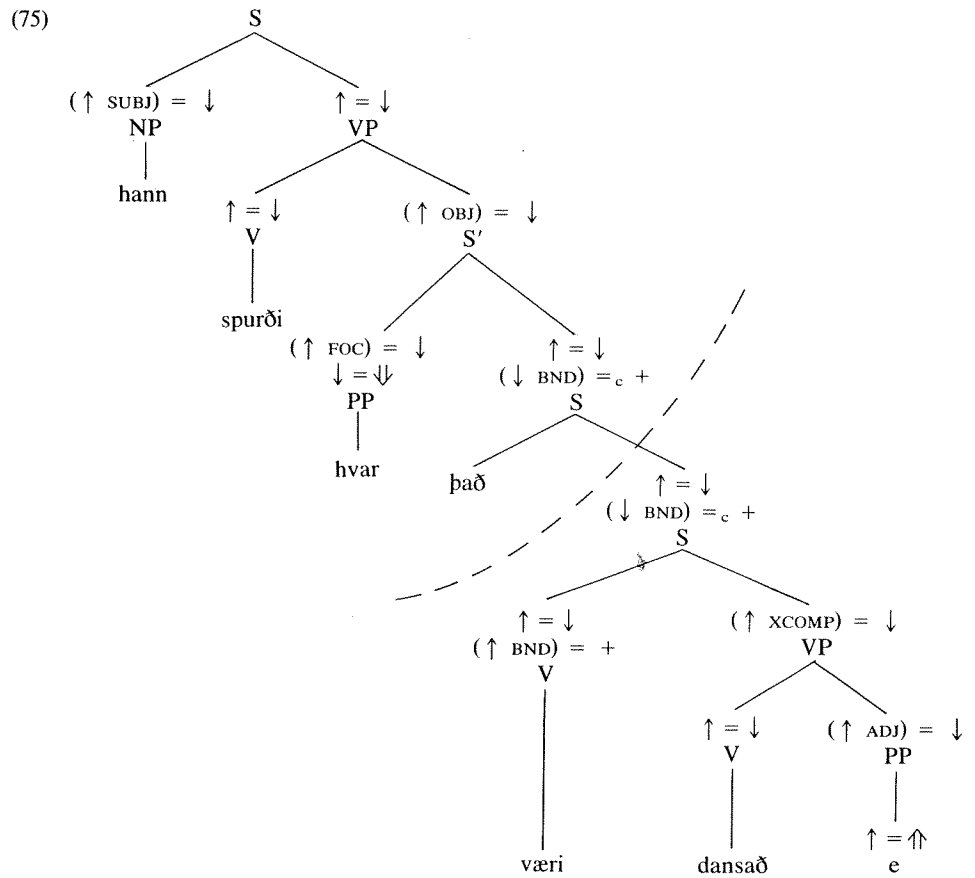
<sup>16</sup> The use of the term *topicalized* is not meant to be very precise here. What I mean is whatever discourse function questioned elements, topics, and heads of relative clauses have in common.

<sup>17</sup> There is a way to eliminate the inelegant unless-clause in the definition of unbound sentences and to simplify the PSRs of Icelandic. The two rules that I have discussed in connection with the appearance or nonappearance of *það* are arguably lexical rules. These rules could be assigned two possible outputs, one with a +BND verb and one with a -BND verb, as schematized for the impersonal passive in (i).

$$(i) \quad \begin{array}{l} V \\ (\uparrow \text{ BND}) = + \\ \text{and} \\ V \quad (\uparrow \text{ SUBJ FORM}) = \text{það} \\ (\uparrow \text{ BND}) = - \end{array}$$

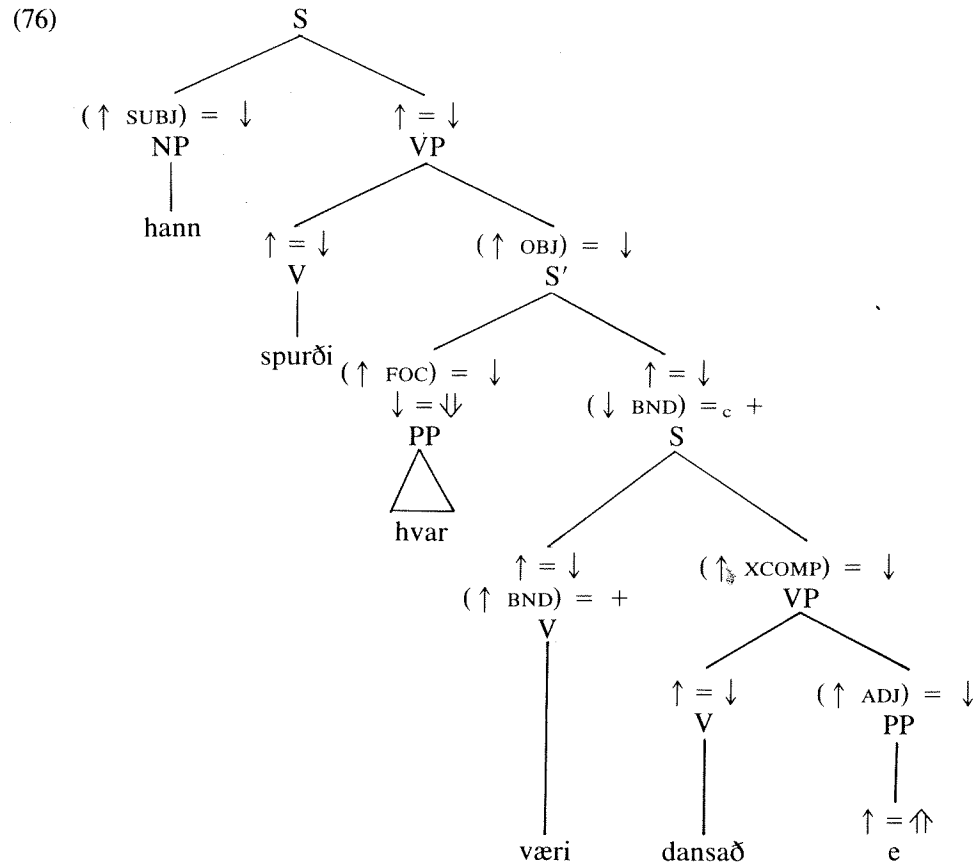
For indefinite subject extraposition we could have a similar rule again having two versions, one with a -BND verb and *það* and one with a +BND verb without *það*.

As can be seen, however, that account leads to rule duplication; this will most likely become even clearer when weather verbs and the like are taken into account. Also, it assumes that *það* is a placeholder for a subject, a position for which there is no evidence (see Maling and Zaenen (1981)).



Here the features agree correctly, but the linking equation on *hvar* is not transmitted further than the dotted line (i.e. the first subjacent S) and is not linked to a  $\downarrow\downarrow$  in that domain. Hence, the sentence violates the well-formedness condition on linking equations. Without the dummy, everything is all right, as the earlier example (60) and its c-structure (76) show.

- (60) Hann spurði, hvar væri dansað.  
 he asked where was danced  
 'He asked where people danced.'



Unlike the ADJ PP in (75), the ADJ PP in (76) is accessible to the binder.

#### 4. Discussion

As I have shown, syntactic binding domain phenomena can be characterized in a natural way in LFG. The only substantive assumption that needs to be made is that the  $+/-\text{BND}$  feature is inflectional and is part of a set of clausal features. Its distribution then follows from independently established conventions (the Major and Minor Category Conventions and the Head Convention). What I want to argue here is that the  $\text{BND}$  feature falls naturally within the class of clausal features such as tense and mode. As is well known, this is universally a rather large class all of whose members are not realized in all languages. This happens also to be the case with the  $\text{BND}$  feature. Since no full-fledged treatment of tense/mode phenomena is yet available, I will only point to intuitive relationships here.

Consider a case like Irish, where a particular form of the complementizer accompanies a particular form of the verb. This is the same type of dependency that exists in

English between *that* and +FIN verb forms, for example, or in French between *avant que* 'before' and the subjunctive.

Interestingly enough, most languages discussed here, as well as a few others, show evidence that the mode system of the language and the possibility for binding within certain domains are related. As K&P point out, SI is in fact not limited to binding domains but can also occur in subjunctive clauses. Hence, PSR (70) should actually allow for two cases: verbs that are "bound" and subjunctive verbs. In Kikuyu, downstep deletion is not limited to binding domains but can also be found in a few other contexts, e.g. negative tenses, regardless of syntactic context.

Moreover, there are languages where the mode determines the binding possibilities. It was long assumed that binding into embedded clauses in Russian was impossible. However, Pesetsky (personal communication) has found that this holds only for indicative clauses, extraction out of subjunctives being in fact possible. Hence, the following contrast is found:

- (77) \*Kogo ty skazal, čto Maša celovala?  
       who you said that Masha was kissing  
       'Who did you say that Masha was kissing?'  
 (78) Kogo ty xotel, čtoby Maša celovala?  
       who you wanted that + subj. Masha was kissing  
       'Who did you want that Masha should kiss?'

Similarly, if one wants to assume that extraction in German is possible out of a certain type of embedded clause, one could characterize the type in terms of the primitives discussed here (see Thiersch (1978) for some data and an (inconclusive) discussion of the desirability of considering the data as cases of extraction out of embedded clauses as opposed to cases of parenthetical verbs).

Furthermore, mode can be expressed by a combination of word order (mainly "inversion" constructions) and verb inflection or even by word order alone, as exemplified in the Dutch examples (79a) and (79b), respectively.

- (79) a. Ware hij hier, we zouden gelukkig zijn.  
       were he here we would happy be  
       'Were he here, we would be happy.'  
       b. Was hij hier, we zouden gelukkig zijn.  
       was he here we would happy be

This seems to indicate the need for a representation that generalizes over "real" inflection and some word order patterns. This generalization is made here by extending the notion of inflectional feature.

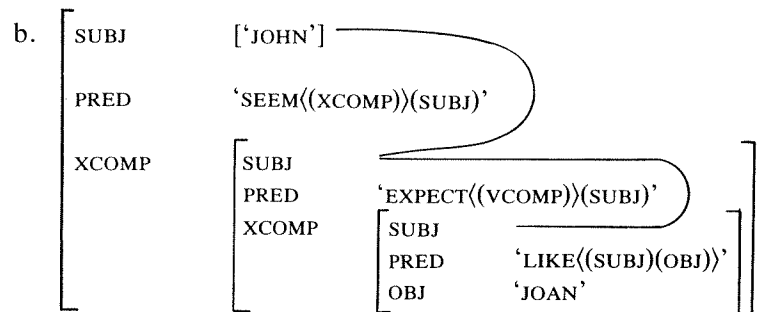
As I do not see any interesting way to bring out this relation beyond what is immediately deducible from the treatment in section 2, I leave these remarks on the informal level. The basic intuition behind them is that it is more plausible that similar phenomena

would be conditioned by similar factors than that they would be conditioned by factors belonging to very different subsystems.

Finally, note the distinction between constructions involving syntactic binding and those involving functional control. In LFG, the linking equations do not carry information about the functional features of the binder. Kaplan and Bresnan (1982) argue that it is necessary to transmit information about the categorial features of the bindee but there is no information about gender, number, or case (the *functional features*). These features are constrained by the fact that ultimately the variable associated with the binder is equated in f-structure to the variable associated with the bindee. Hence, for example, the case of the binder is constrained by the case requirements of the bindee. But these constraints are not imposed in c-structure.

In this respect, syntactic binding is different from functional control. In functional control cases, the controlled constituent has a function in all the clauses that lie between the controlled element and its binder. This is what happens in raising, as the following (simplified) f-structure illustrates:

(80) a. John seems to be expected to like Joan.



The lexical entry for *seem* will include the following information:

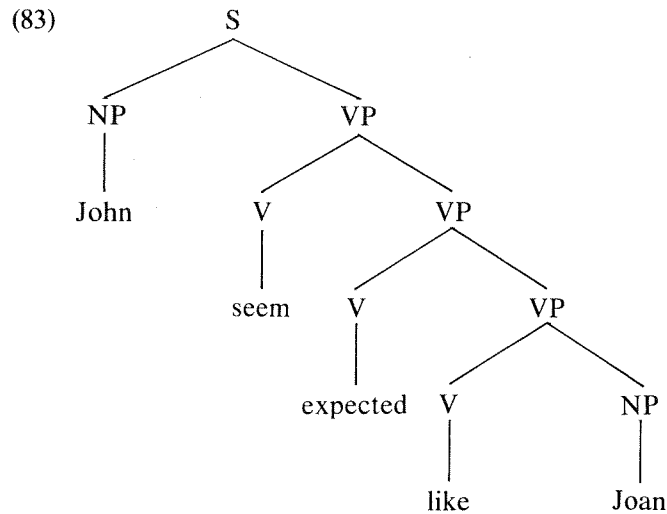
(81) *seem*: V, (↑ PRED) = 'SEEM<((XCOMP))>(SUBJ)'  
 (↑ SUBJ) = (↑ XCOMP SUBJ)

Similarly, the passive *is expected* has the following partial entry:

(82) *expected*: V, (↑ PRED) = 'EXPECT<((XCOMP))>(SUBJ)'  
 (↑ SUBJ) = (↑ XCOMP SUBJ)

The c-structure for a sentence like (80a) is as follows (ignoring *to* and the auxiliary):

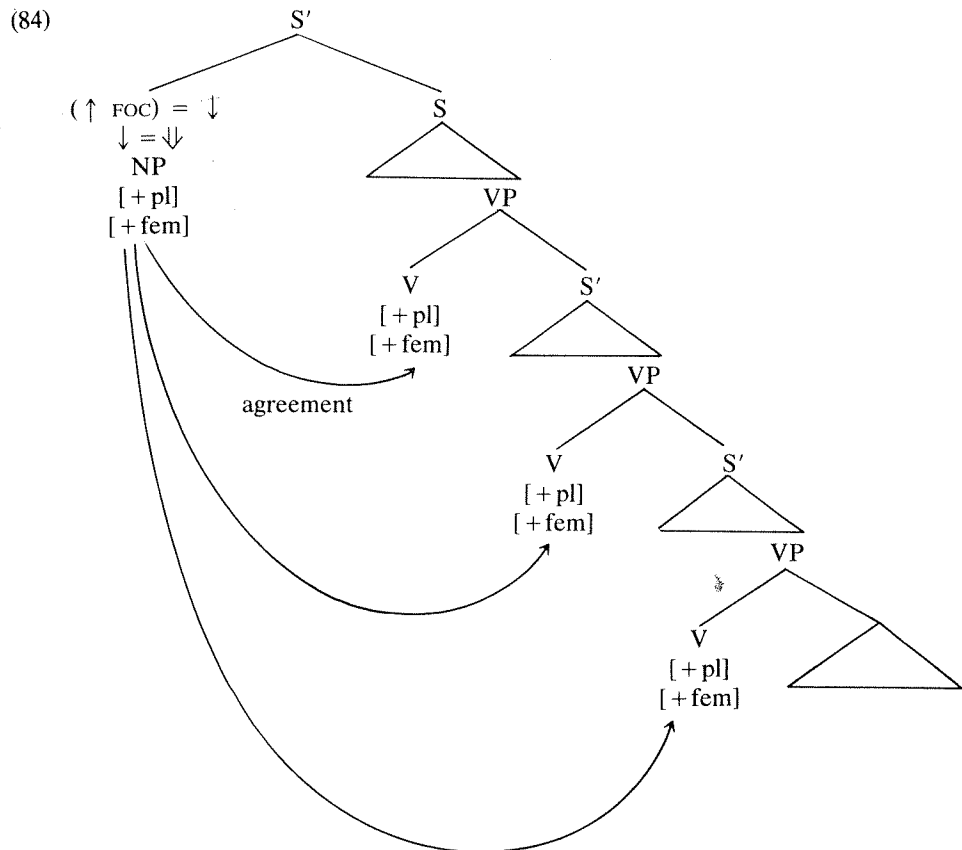




The equations ensure that *John* is at once the SUBJ of *seem*, the SUBJ of the XCOMP of *seem* (namely, *expected*), and the SUBJ of the XCOMP of *expected* (namely, *like Joan*). The equation for *like* will ensure that this verb also has *John* as its SUBJ.

What are the expected differences between functional control and syntactic binding? If a complement is an instance of functional control, we expect it to be limited to a certain class of lexical items—verbs in this instance—and to functionally defined types of constituents, because complement functional control is a property of verbs and refers to the functional relations these verbs enter into. If a construction is an instance of syntactic binding, we expect the intermediate verbs not to be relevant and the types of constituents that can be binders and bindees to be definable on c-structure (e.g. in terms of syntactic categories or position in c-structure). The representation as developed so far thus predicts two clearly different cases of superficially “remote” control, one allowing (for example) agreement in intermediate clauses, the other not. (The distinction corresponds, of course, to the familiar one between cyclic and postcyclic transformations in standard theories of transformational grammar.) The interesting questions are whether the dichotomy can be maintained and whether it has the characteristics predicted by the differences in representation proposed in LFG.

Specifically, with respect to the phenomena under consideration, LFG predicts that there will be no intermediate agreement in cases of syntactic binding, that is, constructions of the type schematized in (84) will not occur (even in cases where the V is in clause-initial position).



This is so because in LFG the information about functional features is not available at the intermediate level; only categorial information can be available at that level. As far as I know, other frameworks do not distinguish between these types of information and would allow cases like (84). This is not a trivial prediction, and it would be worthwhile to examine a few possible counterexamples to it. Unfortunately, none of the ones I know of are well documented enough to be discussed here in any detail. (The most intriguing is described in Bokamba (1980). For a tentative analysis of this, see Zaenen (forthcoming).)

## 5. Conclusion

I have accounted for phenomena like SI while abstracting away from successive cyclic *wh*-movement. This is an advantage because the successive cyclic *wh*-hypothesis leads to awkward analyses in three of the four languages discussed here, as argued in the references cited at the beginning of the article.

I have shown that, granted one rather plausible assumption (namely, that inflectional features can only be associated with lexical nodes) and with two principles already

independently motivated in LFG (namely, the Head Constraint and the hypothesis that S is the relevant level for the characterization of binding domains), we can account for the superficially rather disparate array of facts discussed above by means of just one feature with two values:  $+/-\text{BND}$ . The simplicity of the account given here constitutes strong support for a system of representation that embodies these assumptions.

The analysis given here also makes interesting predictions about the range of phenomena that can be found in syntactic binding domains and hence I hope presents a worthwhile challenge for further research.

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