

1986

On the Notion Maximal Projection

Douglas Saddy
M.I.T.

Follow this and additional works at: <https://scholarworks.umass.edu/nels>



Part of the [Linguistics Commons](#)

Recommended Citation

Saddy, Douglas (1986) "On the Notion Maximal Projection," *North East Linguistics Society*. Vol. 17 , Article 12.

Available at: <https://scholarworks.umass.edu/nels/vol17/iss2/12>

This Article is brought to you for free and open access by the Graduate Linguistics Students Association (GLSA) at ScholarWorks@UMass Amherst. It has been accepted for inclusion in North East Linguistics Society by an authorized editor of ScholarWorks@UMass Amherst. For more information, please contact scholarworks@library.umass.edu.

ON THE NOTION MAXIMAL PROJECTION

DOUGLAS SADDY

M. I. T.

In this paper¹ I will present one aspect of the grammatical composition of elements into phrases. The approach I adopt draws directly on the work of Higginbotham (1985) with respect to the binding of argument positions in lexical items. Much of what is proposed here is similar in spirit to the treatment of phrase structure representation proposed in Speas(1986) and Fukui(1986), the aim being to demonstrate that the requirement of discharging the argument positions associated with lexical items taken together with the requirements of theta theory and the projection principle are adequate to derive the structural representation of phrases. We can thus reduce X-bar theory to the requirement of syntactic projection of the argument structure of items available in the lexicon². My aim here is to provide a principled means to derive and predict the occurrence of Specifier position.

1 Maximal Projection

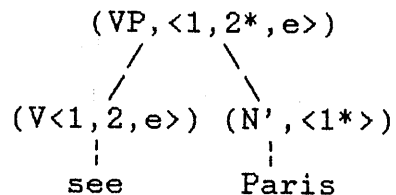
As a starting point I adopt the notion expressed in LGB and elsewhere that there is thematic or argument structure associated with all members of the lexical categories Noun, Verb, Adjective and Preposition. This may extend to include Inflection and Complementizer as well.

DOUGLAS SADDY

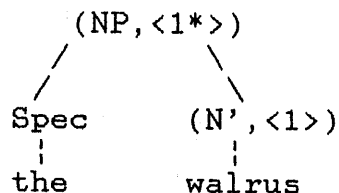
In his 1985 paper 'On Semantics' Higginbotham proposes four basic modes of discharge of thematic positions. These are exemplified below.

The first, theta-marking, is the theta assignment relation that holds between a predicate and an argument. The second, theta-binding, refers to the closure of the argument position of nominals through association with a specifying element. The third, theta-identification, expresses simple modification. Here the argument position of the adjective is identified with the argument position of the nominal but does not saturate the nominal's argument structure. Thus showing that the properties of the modifier are to be attributed to the nominal. The fourth, autonomous theta-marking, involves both theta identification and the discharge of a thematic role in the modifier. This captures the fact that some kinds of modification impart a relational component. That is, a 'big butterfly' is big with respect to other butterflies but not necessarily big with respect to, say, an elephant.

- (1) Theta-marking, exemplified by pairs consisting of a predicate and one of its arguments.³

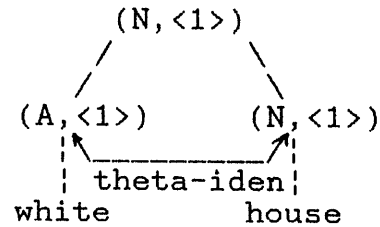


- (2) Theta-binding, exemplified by determiners or measure words and their nominals.

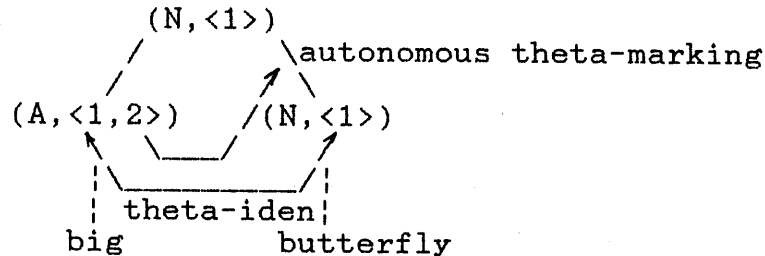


DERIVING SPECIFIERS

(3) Theta-identification, exemplified in simple adjectival modification.



(4) Autonomous theta-marking, where the value assigned to the open position in the theta marker is the attribute given by its sister constituent.



(taken from Higginbotham 1986:14)

In Higginbotham's system these modes of discharge are primitive operations and must be realized, as Speas has argued, in a configuration of 'strict' sisterhood. Also within Higginbotham's system Chomsky's theta criterion is restated:

Theta criterion, Chomsky, 1981:

Every argument is assigned one and only one thematic role.

Every thematic role is assigned to one and only one argument.

Theta criterion, Higginbotham, 1985:

If X discharges a thematic role in Y, then it discharges only one.

Every thematic position is discharged.

The projection principle can be understood as requiring that the argument structures of elements of a string are available at all levels of representation. Thus at D-structure the thematic grids

DOUGLAS SADDY

of each item are represented and the conditions for thematic discharge must be met for the D-structure to be well formed. It then follows that D-structure will be a 'pure representation' of the argument structures projected. It also follows that the structural relations that hold of the elements involved in theta discharge will be determined by the requirements of sisterhood inherent in the nature of the theta-marking, binding, identification and autonomous theta-marking operations taken together with the requirements of the theta criterion.

The foregoing is intended to serve as a brief introduction to a framework in which structural representation is predicted from argument structure. For a more complete discussion of this theory I direct you to Peggy Speas' and Naoki Fukui's dissertations.

I turn now to the notion of maximal projection within this system. In particular I will be concerned with the concept of maximal projection with respect to argument status. It can be shown that within Higginbotham's system the thematic grid of a constituent that is to be an argument must be fully discharged or fully saturated. That an argument must be fully saturated follows from the requirements of the theta criterion and the requirement of sisterhood. I take 'saturation of an argument' to refer to the association of an appropriate morphological or syntactic object with an argument position specified in the lexical entry of a given item.

The intuitive notion of what constitutes a phrase, i.e. VP, NP, PP, AP, IP and CP, can be expressed by stating that a phrase exists when the argument structure of the head is saturated. For example, the argument structure of a given predicator (i.e. V, P) will be saturated through the association of the appropriate complement(s). In the case of arguments, however, saturation is not necessarily achieved through complementation. In many languages full saturation of their argument structure is generally achieved via the association of an overt determiner with the nominal, in other languages this saturation is accomplished via morphological properties.

DERIVING SPECIFIERS

It is held in current Government and Binding Theory that a member, X , of a given lexical or non-lexical category will be represented in the grammar as a syntactic object of the form:

5. X^n
 |
 X^{n-1}
 :
 X^0

where X^0 represents the item's entry in the lexicon, specifying category membership, thematic grid, dictionary meaning etc., and X^n represents the maximum number of levels of projection the particular language will permit.

Note that under this formulation an X -max or the level at which a projection is considered maximal is limited by undefined properties of the grammar and is taken to be uniform across categories⁴. The proposal offered here relates the concept of argument saturation to the concept of maximal projection. That is, assuming the framework outlined above, the maximal projection of an element α of the category X can be defined as the level at which the argument structure of α is saturated.

As noted above, I assume that there is argument structure associated with all members of the lexical and non-lexical categories. This argument structure may be saturated through morphological means. For example, in English a noun may be saturated by the plural morpheme, as in 6.

6. *I like book
 I like books

It may be inherently saturated, as in the case of proper names, as in 7,

7. I like John

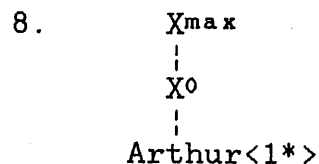
or it may not be fully saturated.

If a lexical or non-lexical item is to act as an argument and is not morphologically or inherently saturated at the X^0 level of representation it must achieve saturation in the syntax through association with an appropriate syntactic object in order to be

DOUGLAS SADDY

well formed. This requirement follows from the theta criterion condition that every thematic position is discharged. Furthermore, since arguments are licensed through their participation in predicate argument relations which hold between maximal projections, this syntactic saturation must occur within the item's maximal projection. The only way for these requirements of argumenthood to be met is through the occurrence of a saturating element within the argument's maximal projection, hence a Specifier position.

It follows then that under the definition of maximal projection presented above, if an item is fully saturated at the point of projection to the syntax, i.e. at X^0 , the X-bar projection will be maximal at the single bar level and no Specifier position will be derived because none is required. For example, in English proper names do not take a determiner and would be represented as a single bar maximal projection, as in 8.



Furthermore, this definition of maximal category predicts that the level of maximality and occurrence of Specifiers can vary according to the properties of the lexical items involved both across languages and language internally.

This conception of structure building makes specific claims about the structural representations of phrases. In particular, in the case of languages whose morphology saturates the open position in nominals, no Specifier position will be derived and the nominals will be maximal at the single bar level. This characterization leads to a number of predictions. Initially we may expect that these languages will not have determiner systems (other than deictics, demonstratives or emphatics). In languages that lack a Specifier position we would expect that syntactic modification will occur through adjunction to the X^{\max} . Since demonstratives encode a kind of modification, in that like adjectives they restrict the range of reference of the argument, we would further expect that when these determiners are used they will pattern with nominal modifiers. As we noted

DERIVING SPECIFIERS

earlier, the modification relation is theta identification. In languages in which theta-binding applies in the morphology we expect theta identification to also apply in the morphology since theta-binding closes the nominals argument domain. The morphological realization of theta identification is agreement, that is, the argument position in the modifier and the argument position in the nominal that are identified bear the same morphological element of closure. When theta identification is realized syntactically the modifier must be sister to a head with an open argument position that is identified. A Specifier occurring in a phrase closes off the argument domain of the head. Thus the syntactic realization of theta identification must take place inside of the maximal projection of the head, i.e. between the Specifier and the head.

2 Diachronic Evidence

I will now turn to a brief discussion of diachronic evidence from Old and Middle English that supports this view.⁵

Both Old English (OE) and, to a lesser degree, Early Middle English (EME) exhibited a rich inflectional morphology. In particular, nouns and adjectives were inflected for number, gender and case. Both languages made very restricted use of determiners. This follows from the assumption that in these languages the inflectional morphology saturated the argument position in these items. Furthermore, in both languages more than one determiner could appear with a particular NP and these were unordered with regard to each other and to adjectives modifying the NP. This follows immediately from the hypothesis that these items appeared in adjoined positions. Adjunction sites are created as needed. The adjunction structure provides for the plenitude of determiners on a single NP, and for the lack of ordering of these items and adjectives.

OE and EME adjectives provide further support for the claim that inflectional morphology can saturate argument positions. These adjectives could be used quite freely as arguments. Both a strong and a weak declension of adjectives were used in OE and to some extent in EME. In the strong declension, the features number and gender as well as the nominative, genitive, dative, accusative and instrumental Case were distinctly marked on the adjective. In the weak

DOUGLAS SADDY

declension these Agreement markings were leveled. Only nominative Case endings were distinct. All of the other 'weak' affixes did not distinguish person, number and gender; nor were the Cases themselves distinguished. It is striking to note that the weak declension of adjectives could only be used as arguments when the adjective was preceded by an article, the demonstrative 'es', or when it was preceded by a possessive pronoun (see Moore, Knott and Hulbert, *The Elements of Old English*, pp.36). These items were themselves marked for the features number and gender. Thus adjectives could be used as arguments only if the features of Agreement appeared overtly in their representation.

In the change from Old to Early Middle English there was a collapse of the distinctive nature of the inflectional morphology, never-the-less, the inflectional morphology remained adequate to saturate the argument structure of nominals. The change from Early Middle to Late Middle English however, was marked by the disappearance of most of the vestiges of inflection. One result of this was the rapid change in the grammar to a system in which nouns were associated with unique determiners and adjectives could no longer occur freely, having to occur within the NP. By the end of the sixteenth century the only adjectives that could occur before a determiner were numerals and quantifiers.

Given the formulation of structure building I have outlined here, this cluster of properties in the evolution of English can be readily explained. The argument position in O.E. and E.M.E. nouns and adjectives was saturated through the inflectional morphology. When this morphology disappeared there was little representational evidence that the argument structure was saturated and the available demonstratives were incorporated as closure elements. Thus a fairly substantial change in the language can be explained, and in fact predicted, in terms of properties already existing in the grammar.

An interesting generalization that seems to be valid is that languages without overt determiner systems often exhibit null subject phenomena. These two phenomena may be related if the Specifier in IP is considered to be performing the same function as the Specifier in NP, that is syntactically saturating an argument position in the head.

DERIVING SPECIFIERS

Berber is a language that fits this profile. It inflects its nouns for gender and number. It does not have any overt articles, although it does have a system of demonstratives. It has rich subject agreement and is null subject.

3 Berber Construct State

Mohammed Guerssel, in a recent paper, utilizes Rizzi's 1982 account of PRO-drop in Italian and Higginbotham's notion of argument binding to account for null subject and construct state phenomena in Berber. In what follows I will show that the Berber facts can be accounted for naturally in the structure building framework I have outlined. The data is taken from Guerssel 1986.

Guerssel points out that Berber is a strong null subject language in that it prohibits overt pronominal subjects all together and permits referential subjects only if they occur in the construct state, see 9-12.

9. *Idir y-zru aryaz
 Idir 3ms-see:per man
 Idir saw the man
10. Zri-x aryaz
 see:per-1sg man
 I saw the man
11. *Aryaz Y-rzem tawwurt
 man 3ms-open:per door
 The man opened the door
12. Y-rzem wryaz tawwurt
 3ms-open:per man:cst door
 The man opened the door

Thus, it is quite generally the case that subject agreement, which appears on the verb morphology, absorbs the external theta role in Berber. This suggests that Berber Infl has strong nominal characteristics. The construct state provides for further specification of the external argument's content.

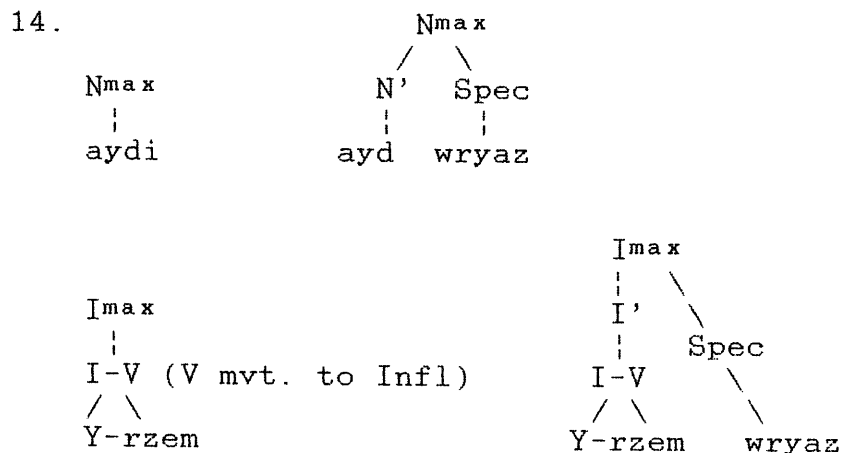
The construct state is also employed in noun complement constructions, see 13.

DOUGLAS SADDY

13. aydi
 dog (masc. sing. indef)
- aydi wryaz
 dog man:cst
 The man's dog

The construct state imparts a definite reading to its head. Thus 13 does not have the meaning 'a man's dog' rather 'the man's dog' and 12 means only 'the man' not 'a man opened the door'. As Guerssel points out, indefiniteness is the unmarked state of Berber nominals. Thus this specificity effect can be accounted for if we claim that the construct state allows a nominal to bind the argument position.

For Berber then we see a close parallelism between NPs and IPs. In both elements the argument structure is usually closed at X⁰. We would thus predict no specifier position to be generated in either case. However, the construct state instantiates an option for the syntactic binding of the argument position thereby deriving a Specifier position, as exemplified in 14.



If we accept the claim that in Berber Infl has argument structure similar to nominals, the null subject property of Berber can be seen to be a particular instantiation of a more general phenomena. In Berber the external argument is bound by Infl, more precisely by AGR. The presence or absence of an overt referential subject is independent of the realization of the external argument and depends only on whether

DERIVING SPECIFIERS

the construct state is employed to further specify the argument.

Note that this characterization of Berber null subject phenomena suggests that PRO-drop may not necessarily be an autonomous parameter of UG but rather may be predictable from lexical and morphological characteristics of a particular grammar.

In closing I would like to point out that inherent in this presentation has been the notion that the operations of theta discharge can have both a morphological and a syntactic representation. That is, languages can differ on how the mechanisms of discharge will be realized, but the operations are the same in both the morphological and syntactic domains, subject to the constraints particular to the domain. Thus the presence or absence of a specifier in some element's maximal projection is determined by just which options for theta discharge are utilized.

-- Notes --

1. The author is grateful for the support of the Department of Linguistics and Philosophy at M.I.T. and the Social Sciences and Humanities Research Council of Canada in the preparation of this paper.

2. For the purposes of this paper I will not distinguish between items in the lexicon and items produced through morphological operations.

3. In these examples and throughout the paper I adopt Higginbotham's notation for argument structure. $X\langle 1, \dots, n \rangle$ represents the structural element X and its associated argument(s). A superscript asterisk indicates that a particular argument has been saturated.

4. See Jackendoff (1977), the 'uniform three level hypothesis'.

5. The phenomena discussed here are taken from an earlier paper co-authored with John Lumsden and I am indebted to him for much useful discussion.

DOUGLAS SADDY

REFERENCES

- Chomsky, N. (1981) Lectures on Government and Binding. Dordrecht: Foris
- Fukui, N. (1986) A theory of Projections and its Applications. Ph.D Dissertation, Massachusetts Institute of Technology, Cambridge, MA.
- Guerssel, M. (1986) "Subject Clitic Doubling in Berber", unpublished manuscript, Massachusetts Institute of Technology, Cambridge, MA.
- Higginbotham, J. (1986) "Elucidations of Meaning", manuscript, Massachusetts Institute of Technology, Cambridge, MA.
- (1985) "On Semantics", Linguistic Inquiry 16:4.
- Lightfoot, D.W. (1979) Principles of Diachronic Syntax. Cambridge Studies in Linguistics 23, Cambridge University Press.
- Lumsden, J. and Saddy D. (1985) "1066 and all That", unpublished manuscript, Massachusetts Institute of Technology, Cambridge, MA.
- Moore, Knot and Hulbert (1977) The Elements of Old English. George Wahr Publ., Ann Arbor, MI.
- Mosse, F. (1952) Handbook of Middle English. Johns Hopkins Press, Baltimore, MD.
- Speas, M.J. (1986) Adjunctions and Projections in Syntax. Ph.D Dissertation, Massachusetts Institute of Technology, Cambridge, MA.
- Stowell, T. (1981) Origins of Phrase Structure. Ph.D Dissertation, Massachusetts Institute of Technology, Cambridge, MA.
- Visser, F. Th. (1970) An Historical Syntax of the English Language. E.J. Brill, Leiden, Netherlands.