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VP Ellipsis in Infinitives: INFL as a Proper Governor*

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1. Introduction

In this paper I argue that the distribution of empty VPs that arise from VP Ellipsis in English infinitives can be accounted for by interacting principles of government and binding. I show that by adopting Zagona's (1982) proposal that empty VPs are subject to the ECP (Chomsky, 1981), and by determining under what conditions INFL properly governs VP, the fact that not all infinitives allow ellipsis is explained straightforwardly. Moreover, the principles that determine when INFL does or does not properly govern an empty VP can be extended to account for what appears to be an unrelated set of data involving the interaction of VP Ellipsis, Auxiliary Reduction and Subject-Auxiliary Inversion in tensed clauses.

2. Ellipsis in Infinitives: Zagona's (1982) Analysis

Zagona (1982, 3.3.1) adopts Wasow's (1972) proposal that VP Ellipsis involves VPs freely generated as empty categories in the base. She proposes that such

empty VPs, like empty NPs in the government-binding framework of Chomsky (1981), are subject to the Empty Category Principle in (1).

(1) The Empty Category Principle (ECP)

[e] must be properly governed

∧

(Chomsky, 1981)

She argues that, in English, INFL properly governs VP when it is filled with an auxiliary verb, a modal or some form of do. This allows her to account for the contrast between (2) and (3), where in (2), VP is properly governed by will in INFL, while in (3), INFL is empty, and the empty VP violates the ECP.

(2) Sally hates to talk to reporters, although she will ∅ if she must.

[she [will] [e]] [if she must]
S' INFL VP S'

(3) *Sally hates to talk to reporters, although she ∅ if she must.

[she [e] [e]] [if she must]
S' INFL VP S'

She proposes that infinitival to properly governs the empty VP in (4-5) in the same way as will does in (2).

(4) Because John persuaded Sally to ∅, he didn't have to talk to the reporters.

[John persuaded Sally [PRO [to] [e]]]
S' S' INFL VP

(5) Mary likes to tour art galleries, but Bill hates to ∅.

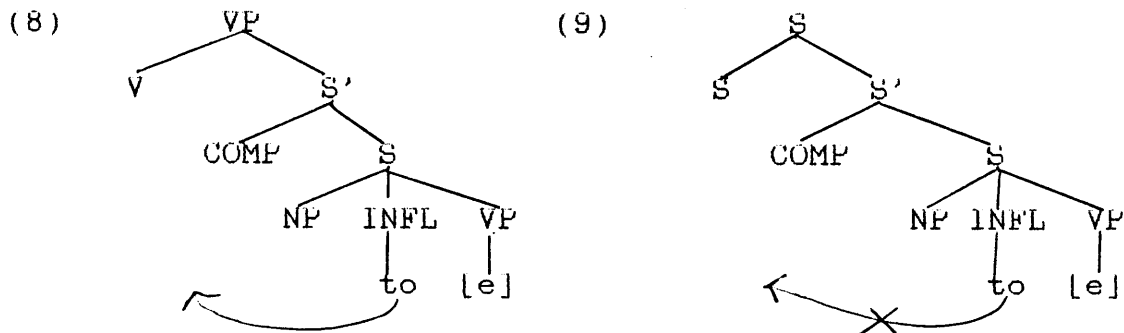
[Bill hates [PRO [to] [e]]]
S' S' INFL VP

She notes, however, (following an observation originally due to Zwicky (1981)), that ellipsis in infinitives is not always allowed, even though INFL is filled with to. For example, it is blocked in the rationale clauses in (6-7):

(6) *Sally rushed to the interview (in order) to ∅, even though she didn't want to talk to the reporters.

- (7) *Mary drives to New York to tour art galleries, but Bill flies to L.A. (in order) to \emptyset .

Zagona accounts for the contrast in grammaticality between (4-5) and (6-7) by analyzing to as undergoing obligatory readjustment to a preceding constituent when to is followed by an empty VP. For her, readjustment involves syntactic restructuring, an operation that is blocked when to is contained in an infinitive outside of VP. Readjustment, and hence ellipsis, is therefore possible in infinitival complements such as in (4-5), which are constituents of VP as illustrated in (8), but blocked in rationale clauses like those in (6-7), which she takes to be adjoined to S, as illustrated in (9).



Zagona's readjustment analysis accounts for the data in (4-7), and supports her hypothesis that the ungrammaticality of ellipsis in certain infinitives follows not from the failure of untensed INFL filled with to to properly govern an empty VP, but rather from the failure of readjustment. Her account fails to explain a wider range of data involving ellipsis in infinitives, however, which suggests that untensed INFL in fact does not uniformly properly govern VP in infinitives.

3. Problems with Readjustment

Under the assumption that readjustment is not blocked in infinitives dominated by VP as illustrated in (8), we expect ellipsis to be grammatical in (10-11), where VP is empty in infinitival purpose clauses. This is not the case, however.

- (10) *John selected Bill to talk to the reporters yesterday, but today he chose Ralph to \emptyset .
- (11) *Even though Mary had a compass to \emptyset , Sally brought the map along to show us the way.

Faraci (1974, 1.3), Jones (1985, 1.3), and Emonds (1985,

Ch.7) argue that infinitival purpose clauses are dominated by VP, which means that, given a readjustment analysis, ellipsis should be equally grammatical in both purpose clauses and infinitival complements, an incorrect prediction.

A readjustment analysis also fails to predict the grammaticality of (12-13), where VP is empty in an extraposed infinitive.

(12) You shouldn't talk to reporters because it's dangerous to \emptyset .

(13) It doesn't bother Mary to tour art galleries, but it certainly annoys Bill to \emptyset .

Baltin (1983) argues that extraposed infinitives are dominated by VP, as in (8). If this is the case, a readjustment analysis predicts that ellipsis should be allowed in infinitival complements, extraposed infinitives, and purpose clauses, all of which are dominated by VP. On the other hand, if we assume, following Emonds (1976, Ch.4) and Williams (1980), that extraposed infinitives are dominated by S as in (9), a readjustment analysis fails to explain why ellipsis is allowed in extraposed infinitives, but not in rationale clauses, both of which are dominated by S.

The evidence in (10-13) suggests that a readjustment analysis fails to adequately explain the distribution of empty VPs in such constructions. We can conclude then that the structural distinction between infinitives illustrated in (8-9) fails to express the appropriate distinction between those infinitives that do and those that do not allow ellipsis.

The appropriate distribution can be descriptively expressed, however, by the generalization in (14):²

(14) Ellipsis is allowed in an infinitive only when the infinitive is lexically governed.

The motivation for (14) is as follows. Under the assumption that lexical government is defined along the lines proposed by Stowell (1981, 6.1), paraphrased in (15), both infinitival complements and extraposed infinitives, where ellipsis is allowed, can be argued to be lexically governed.

(15) Lexical Government

a lexically governs b iff b is both governed by and coindexed with a, where coindexing is by theta-role assignment.

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Infinitival complements such as those in (4-5) are both governed by and assigned a theta-role by a lexical head, in this case a verb, satisfying the conditions for lexical government as defined in (15). As for extraposed infinitives, assuming with Baltin that they are adjoined to and hence dominated by VP, and moreover, that adjunction does not block government, extraposed infinitives can be argued to be governed by V. For them to be lexically governed, however, they must also be coindexed with V by theta-role assignment. We can assume that this is the case, by extending to English Rizzi's (1982) and others' arguments that postverbal subjects in Romance are lexically governed by V. (See, for example, Jaeggli (1982) and Borer (1983)). Extraposed infinitives then, like infinitival complements, are lexically governed, and the fact that both types of infinitives allow ellipsis is consistent with (14).³

In contrast to infinitival complements and extraposed infinitives, rationale and purpose clauses, neither of which allow ellipsis, can be argued to not be lexically governed. Jones (1985, 1.4) argues that such infinitives are not assigned a theta-role by a lexical head, therefore, regardless of their structural position, rationale and purpose clauses are not coindexed with a lexical head by theta-role assignment, and are not lexically governed. Given (14), we expect ellipsis to be ungrammatical in such infinitives, and it is.

(14) also captures another of Zwicky's (1981) observations, that ellipsis is blocked in preverbal infinitival subjects such as those in (16-17).

(16) *You shouldn't talk to reporters because to \emptyset is dangerous.

(17) *It doesn't bother Mary to tour art galleries, but to \emptyset certainly annoys Bill.

Continuing under the assumption that preverbal infinitival subjects are assigned a theta-role by V, those in (16-17) are appropriately coindexed with V to be lexically governed. They are not, however, also governed by V, but rather are governed by INFL, a head that does not assign theta-roles. In contrast to the postverbal infinitival subjects in (12-13), then, the preverbal infinitival subjects in (16-17) are not lexically governed, and (14) expresses the correct generalization that ellipsis in such infinitives is blocked.

It now remains to determine whether (14) can be

derived from independent principles. I propose that it can be, namely from those principles of proper government that determine under what conditions tensed and untensed INFL properly governs VP. As I will show, these principles account not only for the pattern of ellipsis in infinitives, but they can also be extended to account for what at first might appear to be an unrelated set of data involving ellipsis in tensed clauses.

4. VP Ellipsis, Auxiliary Reduction, and Subject-Auxiliary Inversion

Consider now (18), where the auxiliary is has cliticized to the subject of a sentence containing an empty VP, with an ungrammatical result.

(18) *Mary's touring art galleries and Bill's \emptyset too.

Whitney (1985) argues that Auxiliary Reduction involves syntactic adjunction of the auxiliary to an adjacent constituent, with actual phonological reduction taking place at PF. In her analysis, INFL is empty at S-Structure in (18), as illustrated in (19).

(19) [[Bill [is]] [t_i] [e] too]
 S' NP INFL VP

The same analysis of INFL can be extended to (20), whose S-Structure is given in (21). (20) also contrasts with (18), however, in that although is has adjoined to NP, VP is non-empty, and the sentence is grammatical.

(20) Mary's touring an art gallery and Bill's visiting one too.

(21) [[Bill [is]] [t_i] [visiting one too]]
 S' NP INFL VP

Extending a proposal originally due to Zagana (1982, 3.3), Whitney concludes from the contrast between (18) and (20) that when INFL is empty, it fails to properly govern an empty VP. (18) is therefore ruled out by the ECP, while (20), where VP is non-empty, is well-formed.⁴

Now consider (22), a context Whitney does not discuss, where Subject-Auxiliary Inversion has occurred, and where ellipsis is grammatical.

(22) Sally is visiting the museum, but is Bill \emptyset ?

Koopman (1983) argues that Subject-Auxiliary Inversion

involves syntactic movement of INFL into COMP, which means that as in (18), in (22), both INFL and VP are empty. (18) and (22) differ, however, in that in (18), is is adjoined to NP and the sentence is ungrammatical, while in the S-Structure for (22) in (23), is is in COMP, and with a grammatical result.

(23) [is; [Bill [t;] [e]]]
S' S INFL VP

I propose that the contrast between (18) on the one hand, and (20) and (22) on the other can be accounted for by positing two principles of proper government: the Empty Head Condition in (24) and the Revised ECP in (25), both of which are versions of two principles Whitney proposes for slightly different reasons.⁵

(24) The Empty Head Condition

an empty head properly governs only when properly governed
(Lobeck, 1986, 3.2)

(25) The Revised Empty Category Principle

empty phrasal categories must be properly governed
(Lobeck, 1986, 3.2)

By standard accounts of antecedent government, (Chomsky, 1981, Stowell, 1981) is in (18) is blocked from antecedent governing empty INFL by NP, a maximal projection.⁶ Given the Revised ECP in (25), empty INFL, a non-phrasal category, does not violate the ECP, but by the Empty Head Condition in (24), it does fail to properly govern the empty VP. As a result, (18) is ruled out by the ECP.

(18) contrasts with (20) only in that in (20), VP is non-empty, and need not be properly governed. Empty INFL does not violate the Revised ECP, and fails to properly govern VP. Because VP is non-empty, however, no principles are violated, and the sentence is grammatical.

In contrast to the Auxiliary Reduction contexts in (18) and (20), in (22), is has moved into COMP, and assuming with Belletti and Rizzi (1981) that heads govern the heads of their complements, is antecedent governs empty INFL. Given the Empty Head Condition, empty INFL, as a properly governed head, properly governs VP, and as predicted, ellipsis is grammatical.

Returning now to ellipsis in infinitives, in order⁴³² to derive (14) from the interaction of the Empty Head Condition and the revised ECP, untensed INFL must satisfy two conditions: it must be both empty at S-Structure, and properly governed in an infinitive only when that infinitive is lexically governed. When these twin conditions are met, untensed INFL, like empty tensed INFL in (22), is a properly governed empty head, and given the Empty Head Condition, it can properly govern an empty VP.

Such an analysis of untensed INFL is in fact possible, providing we adopt and extend certain principles developed by Emonds (1985).

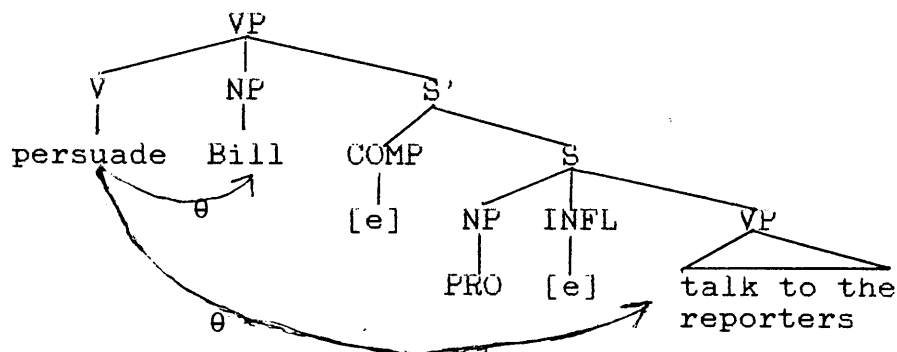
5. Untensed INFL as an Empty Head

Emonds (1985, Ch.s 1-2) develops a theory where the relation between subcategorization and theta-role assignment is expressed by allowing heads to assign theta-roles either to sisters, or to phrases dominated by a sister that dominates no other flanking material.

For example, in his theory, verbs that take obligatory control complements, such as convince or persuade, assign a theta-role to a VP complement embedded in S' at D-Structure. Verbs that select an infinitival complement that can have either a lexical or null subject, such as arrange or beg, on the other hand, assign a theta-role to an S complement embedded in S' at D-Structure.

For persuade to assign a theta-role to VP, a non-sister, the S' dominating VP must dominate no other flanking material. It follows from Emonds's theory of theta-role assignment, then, that the COMP, NP, and INFL nodes in the S' complement of persuade must be empty at D-Structure, as illustrated in (26).

(26)

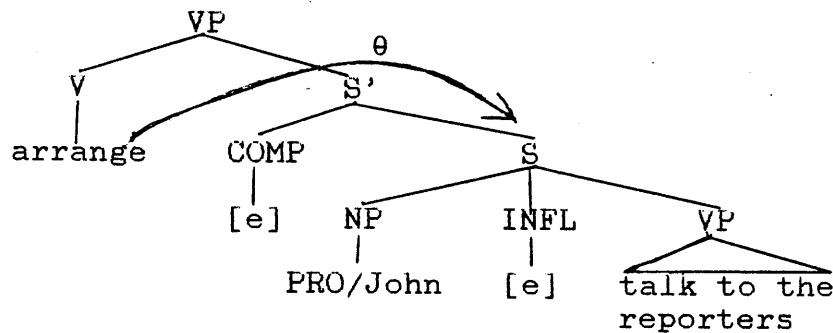


Arrange also assigns a theta-role to a constituent embedded in an S' sister, in this case, S. For theta-

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role assignment to proceed, COMP, the only other node in the S' dominating the S complement of arrange, must be empty, as in (27).

(27)



In contrast to (26), in (27) where S, rather than VP is assigned a theta-role, the NP subject of S need not be empty, as it does not interfere with theta-role assignment to S. Emonds is therefore able to predict that the infinitival complement of arrange can have either a lexical or null subject, while the complement of persuade, where theta-role assignment is to VP, requires an empty subject, and hence obligatory control.

Emonds (1985, Ch. 5) also justifies in some detail a theory of late lexical insertion, where untensed INFL and COMP, empty at D-Structure, are filled with to and for, respectively, at PF when the appropriate conditions are met.⁷ It is reasonable to assume then that late lexical insertion of to and for occurs uniformly at this level, from which it follows that COMP and INFL are empty in all infinitives at S-Structure. We are therefore able to derive the first condition that must be met in order to derive (14) from the principles in (24-25): that untensed INFL is empty at S-Structure.

It remains to derive the condition that empty untensed INFL is properly governed in an infinitive only when that infinitive is lexically governed. This condition can be shown to follow from a reinterpretation of Emonds's theory of theta-role assignment.

6. Chains of Lexical Government

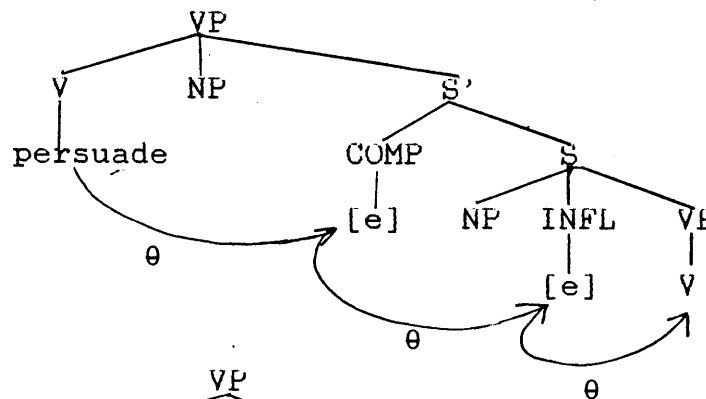
Chomsky (1981) observes that theta-role assignment is typically under government; a head governs the phrasal category to which it assigns a theta-role. In Emonds's theory, however, theta-role assignment can be to constituents not governed by the theta-assigning head, such as VP and S in (26-27). Moreover, Emonds argues that the theta-criterion is best expressed as a

'theta-relatedness' relation between heads, rather than as a relation between a head and a phrasal category. ⁸

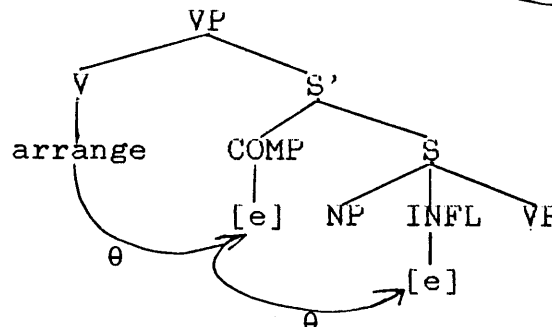
We can preserve both Chomsky's notion that theta-role assignment is under government, and Emonds's that heads can be 'theta-related' by assuming that heads govern the heads of their complements, and that theta-role assignment is through a chain of heads.

For example, both INFL in (26-27), and COMP in (27) can be analyzed as intermediate links in the chain of government between persuade and arrange and their respective complements, VP and S. Assuming that theta-role assignment is head-to-head, theta-role assignment to VP and S can be analyzed as taking place through a chain of heads, as illustrated in (28-29).

(28)



(29)



According to the definition of lexical government in (15), the chains of government in (28) and (29) can also be interpreted as chains of lexical government. This is because each link of the chain, excluding its lexical head, is both governed by and coindexed with the next by theta-role assignment. Empty COMP in both (28-29) then, can be analyzed as being lexically governed by a lexical head. By the Empty Head Condition, COMP is a proper governor, and can properly govern a coindexed empty INFL.

Given the analysis of empty INFL as a properly governed head in (28-29), we can derive (14); empty INFL will properly govern VP only in a lexically governed infinitive because it is only there that empty INFL is in a chain of lexical government, and is itself

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properly governed. By the Empty Head Condition, empty INFL can properly govern VP, allowing us to predict that ellipsis is grammatical in lexically governed infinitival complements and extraposed infinitival subjects. Ellipsis is also predicted to be blocked in infinitives that are not lexically governed, such as preverbal infinitival subjects and infinitival adjuncts, because no chain of lexical government including empty INFL is formed. INFL is not properly governed, and by the Empty Head Condition, it is not able to properly govern VP. As a result, empty VPs in preverbal infinitival subjects and infinitival adjuncts are ruled out by the ECP.

7. Conclusion

The analysis of the distribution of empty VPs in English infinitives presented here provides a unified account of some superficially unrelated patterns of ellipsis data, and supports three central claims. First, it supports Zagana's (1982) hypothesis that empty VPs are subject to the ECP, allowing us to generalize principles of proper government across categories other than NP. Second, the analysis I have proposed depends on adopting Whitney's original proposal that empty heads are not subject to the ECP unless they are required as proper governors. Third and finally, an account of the distribution of empty VPs in terms of chains of lexical government provides supporting evidence that theta-role assignment is head-to-head, through a chain including at least the non-lexical empty heads COMP and INFL as intermediate links.⁹

* I thank Joe Emonds and Ed Battistella for their comments on earlier versions of this paper. All errors are of course my own.

1. Zwicky (1981) is first to attempt to explain the distribution of empty VPs in infinitives in terms of readjustment, although for him, readjustment occurs at what can be interpreted as a post-S-Structure level.

2. (14) is a version of an equivalent generalization proposed in Lobeck, (1986, 4.3.1).

3. According to Chomsky (1981), adjunction does not block government. In his (1986) framework, however, where he adopts May's (1986) definition of domination, an extraposed infinitive adjoined to VP is not dominated by all instances of VP, and hence is not governed by V.

4. Zagona's (1982) analysis of (18) differs from Whitney's, and also from the approach taken in Lobeck (1986) in that she suggests that in Auxiliary Reduction contexts, clitic auxiliaries such as 's are inserted into INFL in the base. When this happens, INFL is not specified for the feature [+V], and is therefore not appropriately 'lexical' in the sense of proper government, ruling out sentences like (18).

See Lobeck (1986) for an alternative analysis of tensed INFL as a proper governor of VP which does not depend on analyzing INFL as a [+V] head, but rather where INFL is analyzed as a specifier with the appropriate features to properly govern VP.

5. Whitney (1985) proposes an equivalent set of conditions to explain the ungrammaticality of (i):

(i) *John's to Mary the best friend in the world.

[[John is _i]	[t _i]	[t _i t _j to Mary]]	[...]
S'	INFL	VP _i	NP _j

She argues that in (i), be has raised from VP into INFL by Be-Raising (Emonds, 1976, 6.2.3). Neither the trace of be in VP nor the intermediate trace in INFL is properly governed; is adjoined to NP fails to properly govern empty INFL, which in turn fails to properly govern the coindexed trace in VP. As a non-properly governed head, the trace in VP fails to properly govern the trace of Heavy NP Shift, and (i) is ruled out by the

ECP.

In contrast to (i), in (ii), she suggests that give properly governs the trace of Heavy NP Shift, and no ECP violation occurs. Moreover, the grammaticality of (ii) indicates that the traces of be in INFL and VP do not violate the ECP, supporting her hypothesis that empty heads are not obligatorily subject to that principle.

(ii) John's giving to Mary the best present in the world.

[[John is] [t:] [t:[giving t_j to Mary]]] [..]
 S' NP INFL VP VP NP_j

See Lobeck (1986, 3.3.2) for an alternative analysis of (i-ii), where the trace of Heavy NP Shift is analyzed as being antecedent, rather than lexically governed.

6. According to Chomsky (1986), is in (18) is not blocked from antecedent governing its trace in INFL because it is not dominated by all instances of NP. (See ftn. 3).

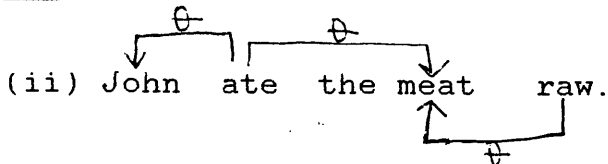
7. For Emonds, for is uniformly inserted into COMP at PF when the subject of S is a lexical NP, for purposes of case-assignment. For details, see Emonds (1985, p. 297).

8. Emonds (1985, Chs.1-2) formulates the theta-criterion in two parts as (i-ii):

(i) Every theta₀-role obligatorily present in the lexical entry of some X₀ must be assigned to exactly one argument X₀. Every phrase which is or constitutes an argument of X₀ must be assigned a theta-role.
 (Emonds, p.41)

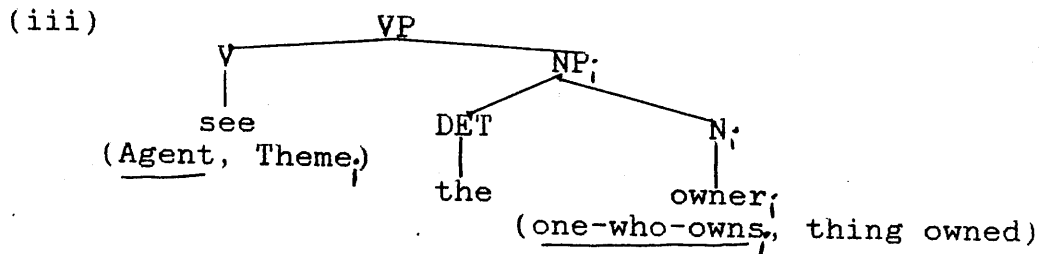
(ii) Revised Theta-Criterion: theta-relatedness is an anti-transitive relation.
 (Emonds, p. 78)

According to Emonds, if two heads B, C are theta-related, and if two heads C, D are theta-related, then B, D may not be theta-related. For example, in (ii), meat can be assigned a theta-role by two heads, ate and raw, without a theta-criterion violation.



Williams (forthcoming) argues that the theta-roles of a head can be 'satisfied' by an argument in the argument structure of the head of its complement. For example, in (iii), see has two theta-roles to satisfy (Agent and Theme), and the head of its complement NP,

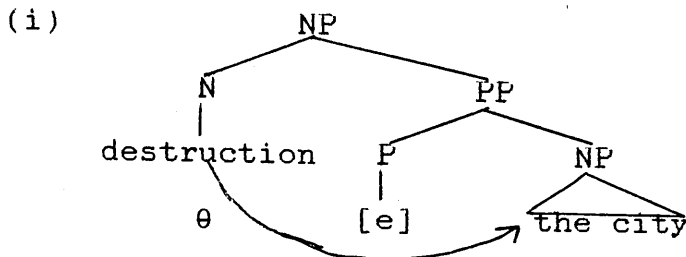
the N owner, also has two theta-roles (the one-who-owns, 438 and the thing-owned).



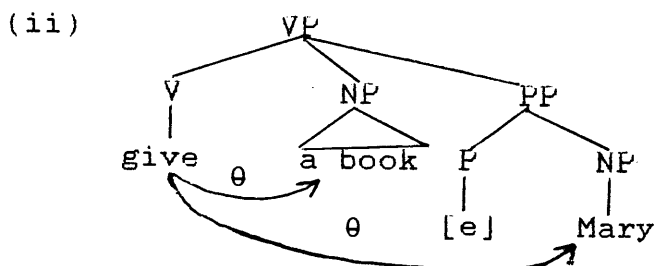
In (iii) the theme of see is coindexed with the external theta-role of owner (the one-who-owns argument). Hence, it is the one-who-owns, not the thing-owned, that is interpreted as the object of see.

More specific details aside, Williams's proposal can be viewed as supporting for the hypothesis that theta-role assignment (his theta-role satisfaction) involves a relation between heads.

9. Emonds (1985, Ch. 1) argues that in addition to COMP, (which he analyzes as a preposition) and untensed INFL, most grammatical formative prepositions are empty at D-Structure in order to allow a lexical head to assign a theta-role to a phrase contained in a PP sister. For example, in (i) the N destruction assigns a theta-role to its NP complement the city, contained in a PP with an empty head.



Similarly, in (ii), the verb give, which for Emonds assigns a theta-role to two NPs, assigns one to an NP dominated by PP with an empty head.



Theta-role assignment to the indirect object NP in (ii), like theta-role assignment to the NP the city in (i),

can also be interpreted as assigning a theta-role to the head of NP through an empty P.

Assuming theta-role assignment through P in (i-ii), the class of 'theta-role transmitting' heads that form a chain of lexical government with a lexical head might be extended to include the unified class of non-lexical heads that are empty at S-Structure, a class including COMP, INFL, and P (or if Emonds's proposal that COMP = P is correct, the class might include only INFL and P). See Lobeck (1986, 4.5) for further discussion of such an approach.

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