

6. CATEGORIES IN THE PARAMETERS PERSPECTIVE: NULL SUBJECTS AND V-TO-I*

The primary aim of this work is to provide an account for the null subject and V-to-I parameters and for their interaction. The data considered are the standard ones in Rizzi (1982) for null subjects, and in Pollock (1989) for V-to-I (in finite sentences). Our discussion is articulated in three sections. After an introduction to parameters and phrasal dependencies in section 1, our version of the V-to-I parameter is presented in section 2, our version of the null subject parameter, together with our conclusions, is presented in section 3.

1. BACKGROUND

Two classical models of the null subject parameter are presented in Chomsky (1981) and Chomsky (1982), following Jaeggli (1982) and Rizzi (1982) respectively. According to the first of these two models the possibility of having null subjects depends on the possibility of moving I to V in the syntax, as in (1). Suppose however that, as proposed in subsequent literature, a constraint holds to the effect that parameters correspond to properties in the lexicon. The version of the null subject parameter in (1) can then be ruled out, in that it violates this principle:

- (1) *Null Subject Parameter (1)*
I can/cannot move to V in the syntax

The idea that parameters correspond to lexical properties, first explicitly suggested in Borer (1984), is formalized in Wexler and Manzini (1987) as the Lexical Parameterization Hypothesis, according to which values of parameters are associated with lexical items. Thus, as argued in Manzini and Wexler (1987), different values of the locality parameter for referential dependencies are associated not with different languages, but with different lexical items within the same language. Assuming that the intuition is correct, we can attempt to reformatize it as the Lexical Parameterization Principle in (2). This says that values of parameters are features, i.e., grammatical classes, that have as their members either single lexical items or else other grammatical classes, i.e., categories:

- (2) *Lexical Parameterization Principle*
Values of parameters are grammatical classes with lexical items or other grammatical classes as their members

Consider now the second classical version of the null subject parameter.

This does not suffer from any problem with respect to (2), since the possibility of null subjects depends on the possibility of I being associated with the feature + pronominal, as in (3). (3) also has the right properties in other respects. In particular, the feature it makes use of is an independently known feature, which is furthermore known to vary independently of the category I:

- (3) *Null Subject Parameter (2)*
I can/cannot be + pronominal

Next, Pollock (1989) argues that languages differ as to whether they allow movement of a main verb and/or an auxiliary to I. In Chomsky's (1989) terms, movement of V to I is allowed or not allowed according to whether I is strong or weak respectively. In other words the parameter in (4) arises:

- (4) *V-to-I Parameter*
I is strong/weak

In what follows we will first review what we take to be the crucial properties of phrasal expletives and then return to our account of the V-to-I parameter. We adopt the theory of indicization in Manzini (to appear) under which all lexical categories and only lexical categories are associated with what we call a categorial index. (Categorial) indices are indices of lexicality, as in (5); in the case of lexical D/N heads they are meant to subsume standard referential indices. The definition of chain, or the definition of sequence that underlies it according to Manzini (to appear), is formulated in terms of c-command and compatible indexing, rather than of coindexing, as in (6):

- (5) α has a (categorial) index iff α is lexical
- (6) $(\alpha_1, \dots, \alpha_n)$ is a sequence iff for all i
 α_i c-commands and has an index compatible with α_{i+1}

Within our theory, then, we postulate the existence of categories that have lexical content and categories that are non-lexical. Formally, lexical categories are represented by (categorial) indices, and nonlexical ones by their absence. If an expletive is lexical we must associate it with an index; at the same time we propose that its dependent status is represented by this index being a variable one. Thus a typical expletive sentence is associated with the indexed structure in (7). We can assume that a variable index has exactly the same properties as the absence of an index from the point of view of sequence formation; in other words, being compatible with all indices, it can enter a sequence with any of them. This means that *there* and *a woman* can form a sequence in (7) as is generally assumed:

- (7) There_x arrived a woman _{i}

It is worth noticing that in terms of the theory that we have developed an anaphor or pronoun must also be associated with a variable index, exactly like an expletive. Hence the morphological identity of expletives and pronouns is not coincidental. The variable index of anaphors and pronouns allows them to participate in sequence formation, exactly as the variable index of expletives. The difference between an expletive and a referential dependency seems to be produced simply by the position of the variable index with respect to the non-variable one. Referential dependencies however have no direct place in our discussion of heads.

2. THE V-TO-I PARAMETER

The standard data concerning V-to-I movement are presented in Pollock (1989). The adverb *completely/complètement/completamente* cannot follow (and must precede) a finite V in English, but it must follow (and cannot precede) it in French and Italian, as in (8)–(9). Let us assume that the base generated position of the adverb is adjoined to V'. Following Pollock (1989) the data in (8)–(9) are explained if finite V must remain in place in English and move to I in both French and Italian. As a consequence, the adverb will show up to the left of V in English, but to its right in French and Italian:

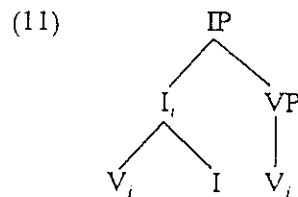
- (8) En. a. *John lost completely his mind
Fr. b. Jean perdit complètement la tête
It. c. Gianni perdette completamente la testa
- (9) En. a. John completely lost his mind
Fr. b. *Jean complètement perdit la tête
It. c. *Gianni completamente perdette la testa

The question is why the head movement patterns individuated in Pollock (1989) and only those are instantiated. What we want to suggest is that the crucial property of English in this respect is that its I is lexical; while the crucial property of French or Italian is that their I's are non-lexical. Thus the relevant parameter is as in (10). The idea is that if I is indexless in French and in Italian, V can move to I exactly like a phrase can move to an empty position; while V cannot move to I in English exactly like a phrase cannot move to an already filled position. If in English the index that I is associated with is a variable index, on the other hand, under our definition this of course allows for the formation of (I, V) expletive sequences:

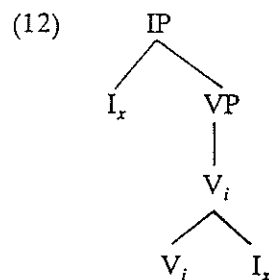
- (10) (*V-to-I*) Parameter
α is/is not lexical

Consider French or Italian. The theory actually accounts for the fact that

V can move to I. In particular, movement of V to I yields the structure in (11). In (11), the index of V percolates up to I, which is indexless, so that I binds the trace of V; the trace of V is then licenced by I. As for the fact that movement must take place, we can adopt the account in Chomsky (1989). According to this, if no movement takes place the resulting configuration is excluded for morphological reasons, relating to the affixal nature of I. Similarly following Chomsky's (1989) account, the reason why I movement to V does not represent a possible alternative to V to I in French or Italian is the Least Effort Principle; we can adopt this either in its original version or in Brody's (1991):



Consider English. The theory automatically accounts for the fact that V cannot be moved to I. Movement of V to I creates the structure $[_I V + I]$, in which the index of V cannot percolate to I, because I already has an index. Thus I does not bind the trace of V, and the trace of V remains unlicensed. However a full account of English must also explain why I is allowed to move to V. The problem of course is that movement of I to V yields the structure in (12), where the trace of I is not bound. What we can assume is that the fact that I remains unlicensed as a trace is irrelevant to the extent that the (I, V) dependency, with V unmoved, is licenced as an expletive dependency:



In other words, the situation in Italian and French can be summarized as in (13), the situation in English as in (14). All of the configurations in (13)–(14) are correctly accounted for under our theory. In English the configuration in (14b) is obligatory if I is affixal, for reasons of morphological wellformedness if we follow Chomsky (1989) as before; the configuration in (14c) is possible and obligatory if I is non-affixal, as in (15). If what precedes is on the right track then, what we have shown is that the

strong/weak parameter in (4) can indeed be translated into a lexical/non-lexical parameter:

(13) (French/Italian)

a. $I \dots V_i$


b. $*I \dots V_i$


c. $*I \dots V_i$

(14) (English)

a. $*I_x \dots V_i$


b. $I_x \dots V_i$


c. $I_x \dots V_i$

(15) John would completely lose his mind

Unfortunately, new patterns arise when auxiliaries are considered. In Italian *completamente* always follows and never precedes an auxiliary, exactly as a main verb. Similarly in French *complètement* always follows and never precedes auxiliaries in finite sentences, exactly as main verbs again. But in English *completely* follows and does not precede finite auxiliaries, contrary to main verbs. This state of affairs is summarized in (16)–(17):

- (16) En. a. John has completely lost his mind
 Fr. b. Jean a complètement perdu la tete
 It. c. Gianni ha completamente perso la testa

- (17) En. a. *John completely has lost his mind
 Fr. b. *Jean complètement a perdu la tete
 It. c. *Gianni completamente a perduto la testa

Since in French and in Italian the situation with auxiliaries is identical to that with main verbs, the same account will hold for (16)–(17) as for (8)–(9). For English however, it is obvious that some property of auxiliaries will induce a different behavior from that of main verbs.

In what precedes, we have derived the fact that a main verb cannot move to I in English from the assumption that I has an index of its own. The same conflict potentially arises between the index of I and the index of an auxiliary; but suppose the auxiliary itself is a dependent lexical head,

technically associated with a variable index. If the auxiliary moves to I, an (expletive, trace) sequence is effectively created, hence a configuration independently known to be wellformed. Thus we account for why V-to-I is permissible with auxiliaries in English (16)–(17). As for why I-to-V is not permissible, Chomsky's (1989) Least Effort Principle can again provide the answer.

In summary, assuming that French and Italian auxiliaries are associated with a variable index like their English counterparts, we are proposing that the situation in (18) holds in French or Italian for auxiliary verbs, parallel to the situation in (13) for main verbs; while the situation in (19) holds for auxiliaries in English, at variance with the situation in (14) for main verbs. The movement configuration in (18a) and (19a) is forced if I is affixal; the non-movement configuration in (18c) is allowed and indeed forced in English if I is non-affixal, as in (20):

(18) (French/Italian)

a. $I \dots V_x$


b. $*I \dots V_x$


c. $*I \dots V_x$

(19) (English)

a. $I_x \dots V_x$


b. $*I_x \dots V_x$


c. $I_x \dots V_x$

(20) John would completely have lost his mind

The paradigm exemplified in (8)–(9) and in (16)–(17) is only one of three main paradigms presented in Pollock (1989). The second paradigm concerns the distribution of floating quantifiers of the type of *all/tous/tutti*; this appears to simply repeat that of adverbs of the type of *completely/complètement/completamente*. The third paradigm concerns the distribution of sentential negations. This appears to largely overlap with that of adverbs and floating quantifiers; since however the overlap is not complete, a separate examination of the paradigm is in order.

Consider English. In main sentences *not*, or its clitic counterpart *n't*, patterns with adverbs with respect to auxiliaries since it must follow them,

but a problem emerges with main verbs. As expected, the negation cannot follow them, but at the same time it cannot precede them either unless *do* is inserted in I position. The entire paradigm is provided in (21)–(22). Thus the problem for English is what blocks (21b) and forces the adoption of (21c):

- (21) a. *John left not (n't)
 b. *John not left
 c. John did not (n't) leave
- (22) a. John has not (n't) left
 b. *John not has left
 c. *John does not (n't) have left

Suppose that following Pollock (1989), Chomsky (1989), Kayne (1989) the negation is itself taken to be a head generated between the I and the V heads. A decision is necessary within our theory as to whether the negation head is lexical or non-lexical. Suppose we take it to be lexical, and indeed associated with an non-variable index owing to its LF content. We can also assume that both *not* and *n't* represent the negation head in English, in its non-clitic and clitic form, respectively.

Consider first why I cannot move to V, yielding (21b). If I moves to V across the negation, a sequence including I and V violates locality, i.e., descriptively the Head Movement Constraint of Travis (1984). On the other hand a sequence including the negation as well as V violates the basic principle of compatibility of indices within a sequence, given that V and the negation have incompatible indices. If this explains the illformedness of (21b), since movement of V to I as in (21a) is independently excluded as before, then the choice of (21c) is forced. I must of course be in the *do* support form for reasons of morphological wellformedness.

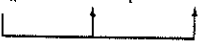
The question, given that I movement to V is impossible across the negation, is how auxiliary movement to I is possible across it, as in (22a). Of course a sequence that involves only I and the auxiliary and bypasses the negation is illformed on locality grounds. However, given that the auxiliary has a variable index, a sequence can be formed, including I, the negation and the auxiliary on compatibility of indices basis, that also respects locality. The question why movement of I to the auxiliary is blocked, as in (22b) can be answered as usual by the Least Effort Principle.

As for the question why *do* cannot cooccur with an auxiliary, as in (22c), what we must have recourse to it again as in Chomsky (1989) some functional principle. Suppose I in English has two allomorphs, an affixal one and non-affixal *do*. We can assume that of the two allomorphs the affixal one is the default one. Thus *do* is resorted to only if the affixal form

is blocked. Since the affixal form is not blocked in the presence of an auxiliary and negation, this means that *do* only surfaces with main verbs and negation.

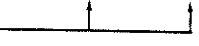
Thus the situation with main verbs and negation in English can be schematized as in (23), the situation with auxiliaries and negation as in (24). The non-movement configuration in (23c) corresponds to the *do* support one; the non-movement configuration in (24c) though not possible with *do* is of course not impossible with *I* in general, as for instance in (25):

(23) a. $*I_x \dots NEG_i \dots V_i$


b. $*I_x \dots NEG_i \dots V_i$


c. $I_x \dots NEG_i \dots V_i$

(24) a. $I_x \dots NEG_i \dots V_x$


b. $*I_x \dots NEG_i \dots V_x$


c. $I_x \dots NEG_x \dots V_x$

(25) John would not/n't have left

By comparison with English, the negation system of Italian is straightforward. The clitic *non* appears in front of the *V* moved to *I*; a negative adverb of the type of *mica* (at all) appears after both auxiliaries and main verbs, exactly as other adverbs we have examined. The relevant paradigm then is as in (26)–(27), which translate the (a) examples in (21)–(22). All of these data are compatible with the negation being a head in Italian, if the negation is non-lexical in Italian. Thus the negation is just a head through which *V* moves on its way to *I*, picking up *non*. The position of *mica* or similar elements is also straightforwardly explained, on the assumption that they fill an adverb position:

(26) Gianni non parti' (*mica*)

(27) Gianni non e' (*mica*) partito

The final remaining case is French. In French again a clitic *ne* precedes *V*; but a correlate to *ne* such as *pas* is obligatory in French, contrary to

Italian where it is merely possible. The position of *pas* generally overlaps with that of adverbs. Thus *pas* follows main verb and auxiliary in finite sentences. The relevant paradigm is given in (28)–(29), which translate the (a) and (b) examples in (21)–(22). If *ne* is a head in French the examples in (28)–(29) are explained on the basis of it being a non-lexical head; V then simply moves through the negation on its way to I:

- (28) a. Jean ne partit pas
b. *Jean ne pas partit

- (29) a. Jean n'est pas parti
b. *Jean ne pas est parti

Thus the resumptive table for the interaction of negation and main verbs/auxiliaries is as in (30)–(31) for French or Italian. It is clear from (30)–(31) when compared to (23)–(24) that a parameter concerning negation also divides English from Italian/French. In particular *not* is lexical in English, while *ne/non* are nonlexical in Italian and French. This leaves the possibility open of treating *pas* as lexical and indeed bearing the LF content of negation in French, thus capturing the parallelism between *not* and *pas* argued for in Pollock (1989); and the same holds for the optional correlate of *non* in Italian. Independent evidence is needed to establish this parameter, but we leave this issue open for further research:

- (30) a. I ... NEG ... V_i


- b. *I ... NEG ... V_i


- c. *I ... NEG ... V_i

- (31) a. I ... NEG ... V_x


- b. *I ... NEG ... V_x


- c. *I ... NEG ... V_x

In conclusion, what we are proposing is extremely simple. Lack of movement to a I head is taken to correspond to the head acting as an expletive. This is true of English finite sentences, and appears by and large to extend to both English and French non-finite ones. By contrast, movement to a I head is taken to correspond to the head being marked for non-lexicality.

This characterizes French and Italian finite sentences as well as Italian non-finite ones. Germanic languages appear to distribute themselves over the two groups, mainland Scandinavian patterning with English, and Icelandic or German/Dutch with French or Italian. If our theory is on the right lines, we expect that V-to-C behaviors should also be reducible (in part) to the lexical/non-lexical parameter. Again this prediction must be left open for further research.

Finally, the parameter in (10) does correlate with a different parameter, a non-syntactic one, namely whether a given head is affixal or not. Roughly, languages which in our terms have non-lexical I are characterized by affixal I, as in Italian and French, respectively. Languages which in our terms have lexical I are characterized by non-affixal I, such as English modals, or zero inflection, such as mainland Scandinavian. However the correlation is not perfect: languages such as English can have affixal I, at a price, the price being lowering and *do* support. Thus the two parameters appear to be irreducible. This of course predicts that there will be affixes that are lexical. Indeed we can take N-incorporation to be *prima facie* evidence to support this claim.

In the next section, we will discuss how two languages like French and Italian that are both characterized by movement of V to I differ in the properties this movement has; and we will argue that this difference corresponds to the null subject parameter.

3. THE NULL SUBJECT PARAMETER

While French and Italian pattern against English with respect to V-to-I, French and English, two typical non null subject languages pattern against Italian, a typical null subject language, with respect to the null subject phenomena in Rizzi (1982). All three languages have canonical lexical subjects, as in (32). But Italian has, and French and English do not have null subjects, as in (33); Italian has, and French and English do not have inverted lexical subjects, as in (34)–(36); and finally French and English have, and Italian does not have, C-t and *wh*-t effects, as in (37)–(38):

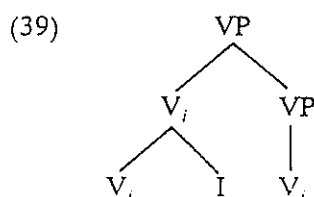
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|------|-----|------------------|
| (32) | It. | Gianni ama Maria |
| | Fr. | Jean aime Marie |
| | En. | John loves Mary |

- | | | |
|------|-----|-------------|
| (33) | It. | Ama Maria |
| | Fr. | *Aime Marie |
| | En. | *Loves Mary |

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|------|-----|------------------------|
| (34) | It. | E' arrivato un bambino |
| | Fr. | *Est arrive' un enfant |
| | En. | *Arrived a child |

- (35) It. Ha telefonato un bambino
Fr. *A telephone' un enfant
En. *Phoned a child
- (36) It. Ha scritto una lettera un bambino
Fr. *A ecrit une lettre un enfant
En. *Has written a letter a child
- (37) It. Chi pensi che sia venuto
Fr. *Qui penses-tu que est venu
En. *Who do you think that came
- (38) It. Chi si chiede perche' e' venuto
Fr. *Qui se demande-t-il pourquoi est venu
En. *Who does he wonder why came

Our idea is that all of the null subject data are accounted for if V moves to I in a null subject language like Italian and adjoins to it; but the derived V + I structure is a V, not an I, as we have assumed so far. Thus the canonical S-structure of an Italian sentence will include the subtree in (39), not the one in (11):



By contrast, if our idea is correct, a non-null subject language such as French or English is characterized either by the verb not moving to I or by it moving to I. If movement takes place, as in French, the relevant structure is as in (11). If no movement takes place, or downward movement of I to V does, as in English, a structure of the type in (12) is obtained. What we must now show is that the distinction between (39) and (11) or (12) is the relevant one for the null subject parameter. If we are correct, at least all of the data in (32)–(38) should be derivable from it.

Under the Lexical Parameterization Principle, the null subject parameter itself can reduce simply to whether I is or is not a head, as in (40), a suggestion put forward in Brody (1989). If it is a property of I that it is a head, then this property is satisfied in (11) before and after V movement to I. The same is true in the absence of V movement to I, as in (12). In (39), however, I is not a head, since it does not project in the X-bar theoretical sense. Thus the structure in (11) or (12) is forced. If on the

other hand I is not a head, the structures in (11) and (12) are blocked, since the IP projection is not licenced under X-bar theory. Thus the structure in (39) is forced:

- (40) *(Null Subject) Parameter*
 α is/is not a head

Intuitively, the content of the parameter in (40) is that null and non-null subject languages differ along the synthetic/analytic divide. Null subject languages are inflectionally synthetic languages where I is totally incorporated into V. Non null subject languages are analytic languages, where I is only partially or not at all incorporated into V. In terms of the theory we are putting forward, English I, having the status of a lexical head, can then be construed as stronger than French I, which has the status of a non-lexical head; the latter in turn can be construed as stronger than Italian I which is not a head. This intuitive hierarchy of strength reverses Chomsky's (1989) ranking of French (and Italian) I as strong with respect to English weak I. Similarly it reverses Kayne's (1989) ranking of Italian I as strong with respect to French (and English) weak I.

There is an obvious reason for this apparent contradiction. Chomsky's (1989) or Kayne's (1989) hierarchies are based on considerations of morphological strength; ours on considerations of syntactic strength. In the languages under exam these two scales of strength appear to run exactly opposite to one another. However our theory makes no (direct) prediction as to the morphological realization of I in the various types of languages. This lack of predictions receives prima facie support by the fact that null subjects are found in the absence of (overt) inflection in languages like Chinese; the same fact forces the claim that morphological homogeneity, as opposed to morphological strength, is relevant for the null subject parameter, as in Jaeggli and Safir (1989).

Consider now the null subject phenomenon, as in (33). Suppose that under the Extended Projection Principle I projects a subject position in (39). What we want to suggest is that an empty category in subject position is licenced as an argument because I is in a clitic configuration with respect to V. Suppose on the other hand I projects an empty position in French where the relevant configuration is as in (11). The empty position cannot be licenced simply because I is a head. Similarly, consider English, as in (12). The licencing of an empty category subject is made impossible in (12), exactly as in (11), by the fact that I is a head and is not a clitic on a head. Thus the subject must be lexical.

On the other hand, lexical subjects, as in (32), are possible not only in languages like English and French, but also in languages like Italian. In Italian and other languages where I is not a head, what we must assume is that the presence of lexical subjects is licenced as a case of clitic doubling. Motivating this assumption implies showing that Italian independently has

clitic doubling, and that clitic doubling occurs without insertion of an extra Case-marker in front of the doubled DP. There is indeed a *prima-facie* candidate for clitic-doubling without P insertion in Italian, namely Clitic Left (and Right) Dislocation, in the sense of Cinque (1990).

The derivation of inversion sentences as in (34)–(36) is comparatively simple. The standard theory holds as in Rizzi (1982) and Burzio (1986) that the possibility of inversion depends on the possibility of a null subject expletive: thus inverted subjects must be related to an expletive, and this can be empty in Italian. This theory straightforwardly transposes to our present framework, since we have already seen that an empty subject can be licensed in (39), while in (11)–(12) only a lexical subject is.

Finally we are in a position to explain the properties of subjects under extraction, as in (37)–(38). We follow Rizzi (1990) in assuming that a subject trace in English or French cannot be immediately adjacent to a C as in (37) or to a *wh*-phrase in the Spec of CP, as in (38), because though it is governed by I, it is not c-commanded by it. It is wellknown that while English (37) can be rendered grammatical by the deletion of *that*, French (37) can be rendered grammatical by an apparent agreement of *que* with I, to give *qui*, as in (41). This suggests, as in Rizzi (1990), that the zero C in English is simply the form of C that agrees with I, as *qui* is in French and that the reason for having an agreeing form in C, is that the trace can then be governed and c-commanded by C. Similarly the reason for the impossibility of a *wh*-phrase in the Spec of CP is that in this case Spec-head agreement between C and the *wh*-phrase preempts agreement of C with I:

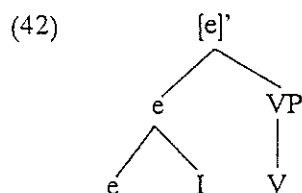
- (41) En. Who do you think came
Fr. Qui penses-tu qui est venu

If French and English (37) and (38) are excluded on c-command grounds, extraction of the subject can be wellformed in (37) and (38) in Italian, simply because inversion is available in the language, as indeed proposed in Rizzi (1982). Thus, subject extraction need not take place from the Spec of IP position, but can take place from an inverted positions, which is c-commanded by its governor, I. It follows that our parameter automatically derives the extraction facts in (37)–(38) by deriving the inversion facts.

Our proposals are easily summed up. Categories differ with respect to whether they are lexical or non-lexical, and with respect to whether they are heads or not in the X-bar theoretical sense. In particular, if I is lexical, it functions as an expletive with respect to V; if I is non-lexical, V moves to it. In other words, the $\pm$ lexical parameter represents the V-to-I parameter. On the other hand, if I is a head, movement of V to I, when possible creates an adjoined structure [_I V + I], with an IP projection; if I is not a head, movement of V to I creates an adjoined structure [_V V + I],

with a VP projection. If we are correct, the structure resulting in the former case is to be identified with a non null subject structure, the structure resulting in the latter case with a null subject structure.

There is at least one important theoretical issue that our theory contributes to D-structure is standardly conceived as the level of representation prior to the application of movement, or viceversa the level of representation derived by the undoing of movement. If so, the question arises what the D-structure of (39) looks like before V moves to I. The easiest solution is that the D-structure counterpart to (39) is as in (42); in (42), then, [e]P represents a projection of the empty head e, whose value is fixed at V after movement:



NOTE

* The initial version of this article, circulated at the Knowledge and Language Conference can be found in Manzini (1989). The present version reflects in part work carried out at NIAS, Wassenaar in the fall/winter of 1990/91 as part of the research project on "The Logical Problem of Language Acquisition" coordinated by T. Hoekstra and H. van der Hulst.

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