

struction discussed there.

18. Notice that he is again not considering non-m-selected L-related movement, an option that he has left open in principle.
19. Excorporation of the infinitive from AGR would leave the clitic behind (i.e. it would cause enclisis), as desired.
20. There is no discussion of the interaction of this non-L-related chain of long movement of the infinitive with non-L-related heads like negation, i.e., it is left open whether/how negation is skipped over or moved to and excorporated from.
21. It seems to me that an additional step must be involved, because otherwise it is unclear why the clitic-auxiliary order of simple sentences is not involved, yielding the unacceptable (i):
(i) *Io avendo Gianni fatto...
22. As in the section on long movement of infinitives, a more comprehensive treatment would include the interaction of (non-L-related) AUX-to-COMP with (non-L-related heads like) negation, but Roberts has no such discussion.
23. This alternative might leave unsatisfied Roberts' desire to be able to point to selective violations of either the head-government or antecedent-government requirement. Take as an extreme example the case Roberts gives as satisfying the head-government but not antecedent-government (his (52)):
(i) *Lo voglio che faccia
it I-want that I-do (subjunctive)

Here *voglio* does not exercise its property of restructuring which Roberts himself has identified with the ability to head-govern a trace in C. Or maybe it's just that the clitic cannot excorporate from overt C the way it is supposed to be unable to from Neg. In fact, it might be interesting to consider a more general alternative analysis in which there is no requirement for antecedent-government, but only one for head-government (as in Rizzi (1990b) for XPs) in combination with the constraint on excorporation from non-L-related heads (as in (14)). And in case the latter turns out to be reducible to head-government, maybe head-government by itself will prove sufficient.

A26

Copy and put back!

12 Licensing heads

Hilda Koopman

1 Introduction

The principles governing the structure of syntactic representations can be seen as a collection of licensing conditions that categories of various types have to meet. Arguments, for example, need to be licensed by theta-role assignment, overt NPs by Case, small *pro* by being identified, negative polarity items by negative elements, anaphors by being appropriately bound to antecedents, expletive pronouns by being replaced by an NP at LF. Licensing conditions are stated in terms of a number of primitive features (nominal or verbal, phonetic or covert, etc.) and relations (government, c-command, Spec-head agreement, coindexing, etc.).

In recent work, Sportiche (1992) has suggested that an entire set of licensing conditions could be reduced to one, namely Spec-head licensing. As illustration, consider two major cases of syntactic XP-movement: wh-movement and NP movement. They represent movement to Spec positions (Spec of CP and Spec of AGR_P , Spec of AGR_P). This type of movement represents a way to license particular XPs, either because the XP is a wh-phrase and has to be licensed in Spec of CP, or because the XP needs Case. Spec positions thus typically function as "licensing" positions, and (overt or covert) movement represents the means to fulfill the licensing requirement: a particular XP is licit because it "counts" as being in the Spec position of a particular (licensing) head.

This general idea brings together a number of results from recent work that has established the privileged status of Spec positions as licensing positions. Some formulations of Case theory assume that (at least structural) Case is attributed to a property of Spec positions which are in a relation with a particular head (Chomsky (1991),

Sportiche (1990)). Rizzi's (1991a) update of May's (1985) *wh*-criterion states that *wh*-phrases are licensed under agreement with a *wh*-head. Moritz & Valois (1992) argue that negative quantifier phrases are licensed in Spec of NegP and derive the distribution of negative elements from movement theory (see also Zanuttini (1991) and references therein). Koopman (1991) argues that pure *phi*-categories (pronouns and anaphors) must be licensed in Spec positions at S-structure. This line of research is pushed furthest in Sportiche (1992), where it is proposed that Spec-head licensing is the most general licensing configuration extending to all cases of movement, theta and case licensing, and scope relations.

Head movement plays a more humble role in this general theory of licensing.¹ Although it has sometimes been proposed that heads must move in order to license their Spec (V-movement was forced in this way in Koopman 1984 for instance), head movement is most often seen as a way to fulfill some kind of morphological licensing, driven by the status of some head as a bound affix or not, or by the need for some stem to get an affix. Head movement in this view is quite accidental depending on language-particular morphological properties.

This paper argues for a much more prominent role of head movement. It represents the way through which a more fundamental licensing requirement is satisfied. Although I subscribe to the reductionist program outlined in Sportiche (1992), which seeks to reduce licensing to Spec-head licensing, I shall argue that Spec-head licensing does not represent the only licensing mechanism: it might be the only licensing relation for XPs, mediated by XP movement. Certain head positions will be argued to provide the licensing positions for other heads. Just as an XP must be licensed in a Spec position to which it is allowed to move given movement theory, thus accounting for the distribution of these XPs, so must a head X be licensed in another head position accessible to it by head movement, accounting in this way for the distribution of XP. This leads to the following picture:

- (1) a. Spec positions are licensing positions for XPs
- b. Head positions are licensing positions for X

where (1a) and (1b) constitute the (only) licensing mechanisms, and movement represents the only way to satisfy them. I will show that head movement is a driving force behind phrase structure.

The focus of this paper is on V-movement in particular and on head movement more generally. There are two types of V-movement: V-to-I to-C and V-to-V movement, also referred to as complex verb forma-

tion, V-incorporation or V-raising (in the Dutch tradition). The questions that I will attempt to answer are why V-movement exists, at which level V-movement must occur, why languages vary with respect to V-movement in the syntax and what the reason for head movement in general is.

In order to address these questions, I first spell out my general assumptions about head movement (section 2). In section 3, I turn to the distribution of VPs in English, and to the question of how their distribution should be accounted for. In 3.1, I argue that a V headed by T and C (a "clausal" VP) is licensed through head movement. I motivate a particular proposal according to which head movement is forced to satisfy the inherent lexical properties of V, and discuss in detail how this licensing is achieved. 3.2 discusses the distribution of bare VP complements in English, which will be shown to fall out from constraints on head movement (this generalizes a proposal by Stowell (1991a) for the distribution of complement small clause APs). This leads to the conclusion that the head of a predicate must be licensed through incorporation (see also Uriagereka (1988)). Section 4 addresses the question at which level the verbal head must incorporate in English (S-structure or LF), and reaches the surprising result that while the head of a VP complement of T and C incorporates at LF, the head of a bare VP complement must incorporate at S-structure. Discussion of verb raising in the Dutch causative construction brings support for this conclusion. I will suggest that obligatory S-structure incorporation follows from the basically defective nature of verbs selecting bare VPs.

Section 5 considers the head that serves as the host of the incorporation. Not all heads will be shown to count as licensing heads for a particular X. This is parallel to the fact that the licensing nature of Spec positions depends on the nature of the head; a *wh*-XP is only licensed in the Spec of an XP whose head bears the feature [+*wh*], a negative XP only in Spec of NegP. Whether a head is a licensing head or not yields a new account for the well-known differences between noun complementation and verb complementation. This account allows us to dispense with the Uniformity Condition of Chomsky (1986a). Section 6 generalizes the proposal that V-movement represents the way in which lexical properties are satisfied to head movement in general: head movement is the means by which all lexical properties are satisfied. Lexical items resemble molecules, with a number of open positions or receptors ("lexical properties") which must be bound ("satisfied"). The receptors are bound by a head that attaches to them. The mechanism which allows a head to attach to a receptor is head

movement. (This proposal represents a particular implementation of what Stowell (1981) called the coindexation of the elements of the theta-grid with the particular arguments.) This proposal has far-reaching consequences: it derives the fact that theta-roles are assigned under government from the way head movement operates and it accounts for the binary branching nature of phrase structure.

2 Head movement

Head movement is strictly local (Koopman (1984), Travis (1984) and Baker (1988)). This follows from the fact that traces must be governed to satisfy the ECP. Government, following arguments in Sportiche (1988b, 1990) and Koopman & Sportiche (1991), is always defined in terms of *i*-command (A *i*-commands B if a sister of A contains B). (2a), (2b) and (2c) satisfy government and represent a possible head movement configuration, but (2d) and (2e) do not:

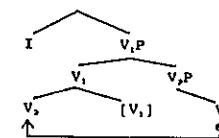
- (2) a. [_X X [_{YP}]]
 b. [X [_{XP} Spec [_Y]]]
 c. [X [_{XP} ZP [_{XP} Spec [_Y]]]]
 d. * [_X [_X X] YP]
 e. *Spec [_X [X]]

I adopt Sportiche's (1990) definition of barrierhood, according to which X^{\max} is never a barrier for X^{\max} .

- (3) X^{\max} is a barrier for B if any non-L-marked projection of X includes B.

This implies that the head of an X category can be extracted from X^{\max} if X^{\max} is L-marked. It follows from (3) that the head of a projection can be extracted, even if some other head has adjoined to it. A head can excorporate in the following configuration, where V_1 represents a verb selecting a bare VP complement (V_2P), and where V_2 adjoins to V_1 :

(4)



- (i) Movement of V_2 to adjoin to V_1 : OK
 (ii) a. Movement of V_1 to I : OK
 b. Movement of V_1 out of [$V_2[V_1]$] : OK
 (iii) Movement of V_2 out of [$V_2[V_1]$] : *

Since V_1 is the head of V_1P , V_1P is not a barrier for movement of V_1 . V_2 , however, is dominated by V_1P ; V_2 is not the head of V_1P ; V_1P therefore is a barrier for V_2 . Dutch verb-raising constructions illustrate the configuration in (4), but, because of Dutch word order, the VPs represent the mirror image of (4). A causative verb like *laten* 'let' selects a bare VP complement, and triggers verb raising: V_2 adjoins to the causative *laten* (V_1). *Laten* subsequently excorporates, as can be concluded from the morphology (*laten* is inflected for past tense in (5a)) and from the fact that it can only be *laten* that undergoes V-to-C movement (verb second).²

- (5) Dutch verb raising (simplified).
 a. dat ik [Jan hier e_i] [liet_i [[komen]]] (V-raising)
 that I John here let come
 'that I let John come here'
 b. Laat_i Jan maar hier [e_i komen]] (excorporation: V-to-C movement)
 Let John but here come
 'Go ahead, let John come here'

A head can therefore be both a target of incorporation, and a target of excorporation (cf. Roberts 1991 for a different view of excorporation). Excorporation will be extensively used in this paper.

(4) restricts the possibilities of head movement either to moving the entire X complex or to moving the head of the X complex. Successive cyclic (adjunction-) head movement therefore cannot exist. This implies that clitic-climbing cannot be analyzed as successive cyclic head movement (as in Kayne (1989b)). It must rather be analyzed as involving movement of XP and possibly subsequent head movement (cf. Sportiche (1988b, 1990 and 1992) for arguments to this effect). Long

distance anaphora cannot be analyzed as successive cyclic head movement, as in Lebeaux (1983) and Cole, Hermon & Sung (1990) among others. The cases analyzed in Lema & Rivero (1990a) and Roberts (1991) as involving long head movement, and the cases of excorporation of adjoined elements discussed in Roberts (1991) must be treated differently as well (cf. Koopman (1991) for an analysis which reduces these cases to local head movement and excorporation).

Head movement further requires that the landing site be an appropriate host for the incorporee, call it a *licensing head* (cf. section 5 for more discussion). Two conditions on head movement must thus be satisfied. First, the target of incorporation, i.e. the incorporee, must be governed by the host (6a), because head movement requires government. And second, the host must be a licensing head for the incorporee (6b):

- (6) a. The incorporee must be governed by the host;
b. The host must be a licensing head

3 The distribution of VPs

What is the distribution of VP and how should it be accounted for? VPs occur as complement of a string of functional categories, the highest of which is C, and as complement of a restricted number of verbs. Specific accounts for the distribution of VPs have been proposed by several authors (Fabb (1983), Zagana (1988a,b), and Guéron & Hoekstra (1988) among others). Zagana (1988b) and Fabb (1983) argue that the distribution of VPs follows from Case theory, in particular from the requirement that VPs (or Vs) need Case: since Case is assigned under adjacency, VPs will be adjacent to the Case assigning head, either I or V. This proposal cannot be maintained, as Zagana (1988b) shows. VPs do not have the distribution of Case-marked NPs. VPs cannot occur in Case positions, overt Case-assigners comparable to *of*-insertion cannot be inserted and VPs cannot undergo rightward movement comparable to heavy-NP shift. Instead, Zagana argues, the distribution of VPs resembles that of theta-marked elements, and should therefore be accounted for in terms of theta-theory. She develops an account by which VPs need to be assigned temporal theta-roles, which they receive from T. Guéron & Hoekstra (1988) follow Zagana (1988b) and Evers (1982): they assume that Vs need to be T(ense)-marked, and develop the notion of T-chain, an S-structure concept. In their account, certain heads (auxiliaries) must be assumed to be transparent for T-

marking of V.

The analysis developed below shares aspects of Zagana's theta-marking by T, or Evers' and Hoekstra & Guéron's T-marking. It differs from these accounts by assuming that verbs can only satisfy T-marking through head movement, and that they do so, depending on the language, at S-structure or at LF. In 3.1, I first develop an account of licensing of VP complements by T/C. This will give the necessary background for discussion of bare VP complements in 3.2.

3.1 V to I to C

VPs occur as complements of a chain of functional categories (which will all be referred to as Is), the highest of which is C in independent (or root) clauses:

- (7) [C [I₁ [I₂ [I₃ [...[VP V* [VP ...]]]]]]]

The structure in (7) assumes layered VPs (Larson (1988)), combined with Sportiche's (1990) proposal for the particular way in which layered VPs are structured. Internal arguments are assigned in VP; the external argument is assigned in a VP-shell, V*P, with V moving to V*. V-to-V* movement is forced by the necessity to assign a theta-role to the external argument (VP shells will be shown to follow from incorporation in section 6 below).³

Languages differ with respect to the S-structure position V occupies. The task of the language learner basically is to figure out how high the V moves up in the I/C chain. In languages like English, it is standardly assumed that V does not move to an I category at all (Emonds (1976) and Pollock (1989)).⁴ In French, the V moves up higher than in English, but not as high as in Vata or Italian, where the V seems to move to the highest I category.⁵ In V-second languages, the V moves up even higher to C if C is ungoverned (i.e. in matrix clauses), although in non-root contexts English-type behavior is found (Norwegian and Swedish) as well as Romance-type behavior (Icelandic and Yiddish).⁶ Although languages vary at S-structure, it is standardly assumed that languages are invariant at LF (cf. Huang 1982, Chomsky 1991, Stowell 1983, May 1977). I assume with Stowell (1983) and others that the verb moves to C at LF in all languages. Language variation with respect to the position of the verb is thus purely an S-structure phenomenon.

What forces V-to-C movement at LF? Stowell (1983), following den Besten (1983), proposes that T is located in C and that Vs must be associated with T, i.e. T-marked. Verbs must move to C because they need

to be T-marked. While I adopt the basics of Stowell's idea, I assume that T is located under IP and that the C projection is required to license TP: e.g. TPs need to be licensed further, while CPs, at least matrix CPs, don't. I will refer to this property of C as "the ability to close a predicate," and return in section 6 to a possible account of this property of C:

- (8) a. T is located in I
b. C closes the predicate

Why do Vs need to be T-marked? Suppose that this follows from inherent lexical properties of the V. Verbs are not only specified for a theta-grid, yielding a classification of Vs in terms of intransitive, unaccusative, transitive verbs, but also for a temporal and aspectual grid (cf. Higginbotham 1985), yielding basic verb classes: statives, activities, achievements, accomplishments.⁷

For reasons of simplicity, I collapse the temporal and aspectual grids and refer to them as the temporal grid.⁸

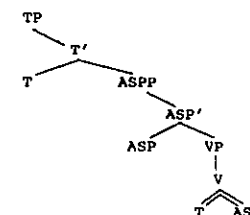
- (9) Vs have an argument-grid (theta-grid) and a "temporal" grid (T-grid)

The T-grid consists of a number of slots or "receptors," depending on the verb class. Each of these receptors must be bound (i.e. licensed), because lexical properties must be satisfied. This forces the appropriate licensers to be projected in the syntax as I heads. Thus, just as the VP structure depends on the theta grid of a particular verb, the I structure depends on the T-grid of a verb.

How exactly is licensing of the T-grid achieved? Each receptor needs to be bound by a designated head. Suppose that a receptor is licensed when the appropriate head attaches to the relevant receptor, i.e. binding reduces to head movement. This will force verb movement to a position from which the designated head can incorporate to the receptor.

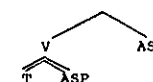
As illustration, consider a particular derivation of a verb with a T-grid containing an aspectual slot ASP and a tense slot T. The particular lexical representation of this V forces the presence of both an ASP head and a T head, which will enter into X-bar theory, and project an ASPP and TP respectively. Since ASP appears to be syntactically lower than T, the underlying syntactic structure is as in (10) (irrelevant details aside). The T-grid of V is represented by double bars attached to the core V:

(10)



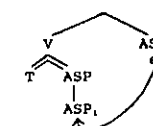
Adjunction of V to ASP yields the structure in (11):

(11a)



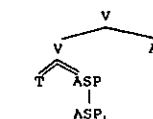
In this representation, ASP is not attached to the ASP-receptor of the V: thus, the ASP-receptor is not licensed. Let us assume that licensing is achieved by further movement of the ASP head onto the ASP-receptor:

(11b)



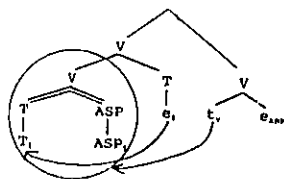
This movement yields a violation of the head movement constraint given the standard assumption that ASP is the head of the complex in (11). I will assume, however, that there is possible ambiguity in this structure about what counts as the head ASP or V. More particularly, I will assume that ASP can incorporate onto the verbal receptor ASP, precisely because V can count as the head of the newly formed complex as in (12), where ASP is sister of V and governed by V. V can therefore attach to the ASP receptor and will be licensed as a trace.

(12)



Consider next the licensing of the T-receptor of V. V will exincorporate from the structure in (12) (this is allowed because V is the head of the newly formed complex) and adjoins to T. T will subsequently move onto the T-receptor of the verb.⁹ This step will again force V to count as the head of the verbal complex:

(13)



The verbal receptors are thus eventually filled with heads, and this is achieved through head movement. The verbal "molecule" heads the clause, with all its receptors filled, and all lower heads are licensed as traces. (8b) further forces V to move to C (see section 8 for a possible motivation of this movement).

Satisfying lexical properties requires at least two local steps of head movement:

- (14) Receptor-binding requires two steps:
- Adjunction of the lexical item to the head
 - Head movement of the licenser onto the receptor of the lexical item

(14) will play an important part in this paper. If (14) is true, we expect to observe both types of incorporation at S-structure. I believe that this is correct; (14a) gives rise to the adjunction type of head movement involved in complex verb formation, (14b) to the substitution type of V-movement involved in V-to-C. Furthermore, the two steps in (14) can describe the crosslinguistic variation in the position of V at S-structure. As pointed out above, the analysis forced me to make the non-standard assumption that a functional category can only move onto the receptor of V if V is the head of that newly formed complex. However, this is only necessary at the point where (14b) must apply, which I assume to be at LF. Suppose that only (14a) applies at S-structure in a particular language. In this case there is no reason not to assume that ASP is the head of the derived complex. But if ASP is the head, the V cannot excorporate to any higher position, precisely because V is not the head. The result then is that V cannot move on. However, if both (14a) and (14b) occur at S-structure, V must be the head (as in (12)). But now, since V is the head of the projection, it can excorporate and move on to higher I projections. This opens up a new way to account for crosslinguistic variation with respect to the S-structure position of the head: only if both steps have occurred can the lexical head excorporate to a higher projection. If only (14b) takes place at S-structure, the verb will not be able to do so.

As a final remark, it is easy to see why the I nodes must be arranged in a head-complement relation: each V must undergo head movement to some I, so that this I in turn can incorporate onto the receptor of V.

3.2 Bare VP complements

We are now ready to address the question how bare VPs which are not dominated by C are licensed. The distribution of bare VPs is extremely restricted (Zagona (1988b)):

- The VP complement contains no overt I if the governing verb is active.
- (15) a. I made Mary visit her mother
b. I let Marie go home
- Bare VPs cannot occur in adjunct positions:
- (16) a. *I finished my work rapidly [PRO go home]
(I finished my work rapidly [(in order) to go home])
b. *I listened to the radio [PRO drive home]
(I listened to the radio driving home)¹⁰
c. *This doctor examines his patients [PRO be nude]
d. This doctor examines his patients [PRO nude]
- Bare VPs are excluded from subject position (Spec of IP):
- (17) a. *[Mary visit her mother] bothers me
b. *[PRO visit one's mother] is nice
- Bare VP complements cannot undergo "rightward" movement:
- (18) *Mary made John yesterday leave the country

Bare VP complements are thus restricted to the complement domain of V, i.e. they must be governed by V at S-structure:¹¹

- (19) Bare VPs must be governed by V
- (19) exactly represents the configuration allowing for head government. We can therefore assume that (19) holds precisely because head movement must occur, just as Baker (1988) proposed for languages with overt morphological causatives.¹²
- (20) The head of a bare VP must incorporate

This raises the question why head movement must occur. The head of a bare VP is not dominated by T/C. Given the arguments in section

3.1, the predicate is not closed by a C head. Let us assume therefore that incorporation represents a way to license the predicate, and put off the details to section 4.5.

- (21) The head of a bare VP complement is licensed by incorporating to V

A further question arises: at which level must head movement occur? At LF, as Stowell (1991a) argues for AP complement clauses, or at S-structure? I return to the latter question in section 4.

It is easy to see how (21) accounts for the distribution of bare VP complements. Bare VPs can occur in complement position because head movement can proceed from this position. Bare VPs are excluded from adjunct position. Because adjuncts are not L-marked, the head of a VP adjunct cannot be licensed by incorporating into a governing head.¹³ Bare VPs are excluded from subject position because of the lack of government between the licensing head V and the head that must incorporate. Bare VPs cannot undergo rightward movement, because of the absence of S-structure government.¹⁴ From the discussion above, it also follows that V is a licensing head for the head of a bare VP:

- (22) V is a licensing head for the head of a bare VP

We return to (22) in section 5.

4 S-structure or LF incorporation

Since the head of a bare VP must be licensed by head movement, its distribution is restricted to the complement position of V. Since V moves to T at LF in English, not at S-structure, the conclusion that V-to-V incorporation should also occur at LF, not at S-structure, seems straightforward.

In this section, I argue that English V-to-V incorporation does indeed happen at LF. However, I will also present evidence that causative verbs must trigger incorporation at S-structure, even in English: they trigger S-structure incorporation of some I that is contained in the bare VP complement.

Incorporation at LF requires government between the licensing head and the incorporating head. Government, however, does not need to hold at S-structure. In particular, the XP can occur in an S-structure position which allows for reconstruction at LF.¹⁵ I assume, without going into the details here, that Spec positions allow for reconstruction¹⁶ but adjunction sites do not. Rightward adjunction rules do

not seem to allow for reconstruction, and rightward VP movement as in (18) is therefore excluded.

S-structure incorporation, however, requires government at S-structure, because the trace of the incorporated head must be antecedent-governed. Any XP with a trace in head position will therefore have a rigidly fixed S-structure position, and movement rules will not be able to apply to them. The following diagnostic criteria therefore distinguish between S-structure or LF incorporation:

- (23) If X incorporates to Y at LF, syntactic movement of XP to a Spec position is allowed
 (24) If X incorporates to Y in the syntax, XP must be governed by Y at S-structure.

English VPs can undergo VP preposing, stranding T at S-structure.

- (25) [visit her doctor every week] she did

VP-preposing is possible precisely because English V-to-T movement occurs at LF.¹⁷ If V-to-T movement occurs at LF, the null hypothesis is that V-to-V incorporation also occurs at LF. Bare VP complements should therefore be able to undergo VP-preposing. Yet they cannot:

- (26) *[Visit her doctor every week] I made Mary (to)

I will argue that (26) is impossible because of (24): S-structure incorporation has occurred. In order to make this point, though, discussion of VP-preposing is necessary, and alternative explanations for (26) must be shown to be inadequate or insufficient.

4.1 VP-preposing

The presence of more inflectional projections in IP raises the question which projection undergoes the process traditionally known as VP-preposing: VP, ASPP, or yet another projection? VP-preposing affects a constituent lower than T, Neg, or ASP, since these elements must be stranded:

- (27) [Writing a letter] she may not have been [—]

This restricts the projection to either VP, V*P, or to some functional projection immediately dominating VP, but lower than any of the projections in (27). The lower VP shell cannot be preposed, because it does not contain the V at S-structure: as assumed above, V always raises to V*. This leaves two possibilities: VP-preposing is preposing of V*P, or

preposing of some functional projection dominating V*P: call this projection I*P. Because the temporal grid of V needs to be licensed at LF, the V*P or I*P will reconstruct, and head movement of V to T will subsequently occur.¹⁸

Bare VP complements fail to undergo VP-preposing:

- (28) a. * [Mary visit her mother every week] I made
b. * [Visit her mother every week] I made Mary

(28a) can be straightforwardly excluded as a Case filter violation and will not be discussed any further. To exclude (28b), it must be decided what the projection of bare VPs is. This is not an easy task and basically all possibilities ranging from bare VPs to CPs have been proposed in the literature. Moreover, in order to account for differences between different types of bare VP complements, it has been argued that bare VPs can actually represent different projections, depending on the verb selecting for the bare VP complement.

Suppose that bare VPs were V*Ps. Under this assumption, (28b) could be accounted for if *Mary* is contained within this V*P: the NP could not have been stranded. This analysis runs into problems with AP-preposing: AP-preposing in the same environment is perfect:

- (29) How angry did you make Mary?

If *make* takes a V*P in (28), *make* should also take an A*P in (29) since the number of shells is determined by the lexical property of the lexical item. If V must move to V* for external theta-role assignment reasons, A must move to A* for the same reason. If AP-preposing affects A*P, NP should not be able to be stranded. The following variant of this idea would work. Suppose that VP-preposing is I*P-preposing, and that causative verbs take I*P complements.

- (30) a. I made [_{I*P} Mary [_{I*}] [_{V*P}] e [visit her mother]]

I*P-Preposing →

- b. *Mary visit her mother you made
c. *Visit her mother I made Mary

- d. I made [_{I*P} Mary [_{I*}] [_{AP}] e [angry e]]

AP-Preposing →

- e. How angry did you make [Mary [_{I*}] [_{AP}] e]]

The paradigm now follows. I*P-preposing is excluded, because the NP *Mary* must pied-pipe, and fails to get Case (30b).¹⁹ The NP cannot be stranded because it is part of the projection that undergoes movement

(40c). AP-preposing on the other hand is possible, because the subject of the AP has raised out to Spec of I*P; the AP can therefore be preposed, leaving its subject stranded.

There are several problems with this analysis. First, it is based on the fact that the NP is contained in the I*P and has not raised to some higher Spec position. Indeed, if the NP could raise outside I*P, the result should be grammatical, just as raising out of the AP to Spec of IP is in (30e). Second, it forces a treatment of all causative complements as equal to or smaller than I*P, which is almost certainly incorrect.

4.2 Causatives trigger S-structure incorporation

(24) offers a different explanation for the paradigm in (28). Suppose that causative verbs indeed take I*P complements (or even bigger complements), and that VP-preposing is I*P-preposing. Suppose moreover that I*P cannot be preposed, because its head incorporates at S-structure. The underlying structure then is as in (31a):

- (31) a. [_{V*P(1)} Spec V* [_{VP} Spec [_V make _V [_{I*P} I* V*P(2)]]]]

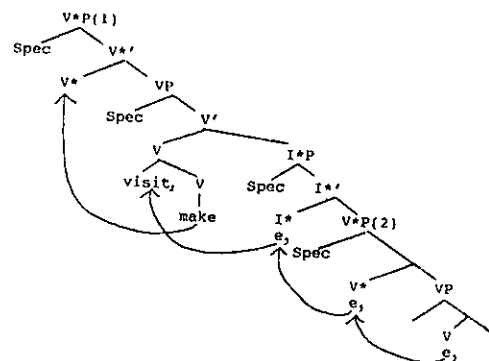
The causative verb triggers S-structure incorporation of the head of the I*P, I*. I*P therefore cannot undergo I*P-preposing, because the trace in the head position would not be antecedent-governed.

There are two ways to work out this idea, depending on whether V moves to I* or not. If V moves to I*, English would literally have V-incorporation at S-structure. If V moves to I* at LF, as I assume below, English has I*-incorporation at S-structure, but V-incorporation at LF.

Suppose first that V moves to I* and that English has literal V-incorporation at S-structure. Verbs like *make* take an I*P complement, and the embedded V moves to I*. From I*, V incorporates into *make*, and *make* in turn exorporates to V*, the position from which accusative Case is assigned to Spec of VP, and the external theta-role to Spec of V*P:

- (32) [_{V*P} Spec [_{V*} make]_k [_{VP} [_{Spec} Mary_i [_{visit} e_k]_k [_{I*P} [_{[NP} e] [_{I*}] [_e]_j [_{VP} e_j]]]]]]]

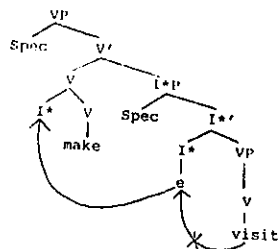
(32) a.



I*P of course can still not be preposed, because the trace in the head position would fail to be antecedent-governed at S-structure. There are problems with this analysis. First, the causative verb must excorporate within the thematic projection of the causative. This raises the question why excorporation does not appear to be forced in the same way in other languages (cf. Dutch, Italian, French), where the full verbal complex seems to move to V* yielding strings like *make sleep John*.²⁰ Secondly, V-movement in this configuration often affects the Case-assigning properties of the embedded verb. In English, however, the verb behaves as if it occupies the same position as it does in a normal sentence, and it assigns exactly the same cases as a verb heading any VP. And thirdly, this solution is rigid in the sense that it disallows treating some causative complements as bigger units like IPs or even TPs with empty heads. This is because these projections contain heads which the English V cannot reach: V-to-V movement should therefore be blocked.

Suppose therefore that V does not move to I* in the syntax in English, and that it is I* which incorporates.²¹ Since V cannot raise to I*, it appears as if incorporation has not taken place, and V₂ acts in all respects as if occurring in the usual V-position:

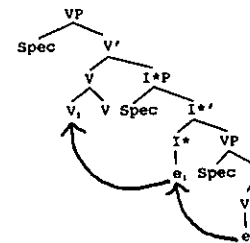
(31) b.



This is the solution that I will adopt. At LF, the V moves through the available head positions to the position where I* is at S-structure. (I

return below to the licensing of the T-grid of the embedded verb in (31).)

(31) c.



So far, then, V-to-T movement in English occurs at LF when T is governed by C, because preposing of I*P (VP-preposing) at S-structure is possible: I* is therefore not a trace at S-structure. But I have also argued that I*-to-V movement occurs at S-structure, when I* is governed by V, because preposing of I*P cannot occur at S-structure: I* therefore is a trace at S-structure. This yields the following picture:

(33) a. T does not trigger S-structure incorporation

b. Causative verbs obligatorily trigger S-structure incorporation

(33) seems to cause serious problems for the analysis. Why should it hold? What forces S-structure incorporation with causatives? Why should it be the licenser that determines if incorporation can occur at LF or at S-structure? Before suggesting an explanation for (33b) within the general framework of licensing developed here, let me first present additional evidence for (33b) based on Dutch causatives.

4.3 The causative in Dutch

In Dutch verb raising constructions, verb raising is generally optional in the following context:

(34) In a string V₁V₂ where V₂ governs V₁, V₁ raises *optionally* to V₂

V-raising becomes *obligatory* when more than two verbs are involved.

(35) a. dat Jan gekomen is (no V-raising)

that John come is
'John came'

b. dat Jan is gekomen (V-raising)

that John is come
'John came'

- (36) a. dat Marie haar moeder bezoeken wou (*no V-raising*)
 that Mary her mother visit wanted
 'that Mary wanted to visit her mother'
 b. dat Marie haar moeder wou bezoeken (*V-raising*)
 that Mary her mother wanted visit
 'that Mary wanted to visit her mother'
 c. dat Marie haar moeder heeft willen bezoeken
 (*obligatory V-raising*)
 that Mary her mother has want visit
 'that Mary wanted to visit her mother'

In the (a) examples above, the embedded verb precedes the auxiliary or the modal: V-raising has not taken place. In the (b) examples, the embedded verb follows the inflected verb as a result of V-raising. (36c) illustrates obligatory V-raising.

Dutch also has a process of I*P-preposing. I*P-preposing should be possible when V has not raised higher than I*, i.e. when V-raising is optional (cf. also Koster 1987). This is correct, as the following examples show:

- (37) a. [naar huis gekomen] is Jan niet
 to home come is John not
 'come home, John did not'
 b. [haar moeder bezoeken] wou Marie niet
 her mother visit wanted Mary not
 'visit her mother Mary didn't want to'

Given the discussion above on incorporation at S-structure or LF, I*P should not be possible when V-raising must apply (either V-to-C, or V-to-V), since the I*P would contain the trace of the incorporated verb in the head position. This is borne out, as the examples in (38) show:

- (38) a. '[iemand koekjes e] gaf ik niet (*main V to C*)
 someone cookies gave I not
 (39) a. dat Jan niet naar huis heeft willen gaan (*obligatory V-raising*:
 *gaan willen heeft)
 that John not to house has want go
 'that John has not wanted to go home'
 b. *[naar huis gaan] heeft Jan niet willen
 to house go has John not want
 (40) a. dat Marie haar moeder heeft willen bezoeken
 (*obligatory V-raising*: *bezoeken willen heeft)

that Mary her mother has want visit
 'that Mary wanted to visit her mother'

- b. *haar moeder bezoeken heeft Marie vast wel willen
 her mother visit has Mary certainly want

With this background, let us turn to the Dutch causative verb, *laten*, which has both a permissive and causative meaning (Dutch does not truly have a causative verb corresponding to *make*). In the configuration in (34), *laten* acts differently from other V-raising verbs, in the sense that V-raising generally seems to be preferred:

- (41) a. omdat ik de kinderen boeken laat lezen (*V-raising*)
 because I the children books let read
 'because I make/let the children read books'
 b. ? omdat ik de kinderen zulke boeken best lezen laat
 (*no V-raising*)
 because I the children such books read let
 'because I have no problem letting the children read such books'

Interestingly, however, (41b) only seems to allow the permissive reading, not the causative one. This suggests that causative *laten* obligatorily triggers V-incorporation, but permissive *laten* does not.

How does the complement of *laten* fare under I*P-preposing? As the examples in (42) show, the complement of *laten* can be preposed. However, in this case only the permissive reading is available and the causative reading is excluded.

- (42) a. de auto wassen laat ik Jan nooit (only permissive/*causative)
 the car wash let I John never
 *wash the car I never let John
 b. *zulke boeken door de kinderen lezen laat ik nooit²²
 such books by the children read let I never
 c. het huis schoonmaken laat Marie hem iedere week
 the house clean let/*makes Mary him every week
 *clean house Mary lets him every week'

The unavailability of the causative reading in (41b) and (42) follows if causative *laten* obligatorily triggers S-structure incorporation of I*. Since the V moves to I*, V-raising is obligatory with causative *laten*. We thus arrive at a somewhat surprising result that Dutch causative *laten* obligatorily triggers S-structure incorporation, but permissive *laten* does not:

- (43) a. Causative *laten* must incorporate I* at S-structure
 b. Permissive *laten* may incorporate I* at S-structure

(43a) accounts for the obligatoriness of V-raising at S-structure (41a), and the unavailability of the causative reading under I*P-preposing illustrated in (42). The examples also lead to the conclusion that permissive *laten* does not need to incorporate I* at S-structure. Other verbs selecting for bare VP complements, like perception verbs, act like permissive *laten*. Thus S-structure V-raising is optional in the configuration in (34), and I*P-preposing is possible:

- (44) a. dat ik Marie de auto zag wassen/wassen zag
 that I Mary the car saw wash / wash saw
 'that I saw Mary wash the car'
 b. de auto wassen zag ik Marie nooit
 the car wash saw I Mary never
 '*Wash the car I never saw Mary'

A similar conclusion holds for French. While French has both a causative *faire* and (permissive) *laisser*, only causative *faire* triggers obligatory V'-preposing (V-fronting). *Laisser* (and perception verbs) do so optionally:

- (45) a. J'ai fait/laissé manger la soupe à Jean
 I have made let eat the soup to John
 'I made John eat the soup'
 b. J'ai *fait/laissé Jean manger la soupe
 I have made/let John eat the soup

Suppose that the French verbal complex results from V-to-I* movement and I* adjunction to *faire* followed by excorporation of *faire* (Bok-Bennema (1991)). (45a) then shows that *faire* must incorporate I* at S-structure, and that *laisser* may incorporate I* at S-structure.

In conclusion, the Dutch causative verb *laten* obligatorily triggers S-structure incorporation, and so does the French causative *faire*. This property of Dutch can surely not be a learned property given the high degree of opaqueness of the data. If it cannot be learned, it must be universal. We thus get strong support for the proposed analysis of English in (33b), at least as far as causative verbs are concerned; English causative verbs must trigger S-structure incorporation. However, the discussion on Dutch and French also shows that other verbs selecting bare VPs do not need to trigger S-structure incorporation. This implies that failure of preposing a bare VP complement can-

not always be due to the fact that the selecting verb triggers S-structure incorporation. The question thus arises again what excludes I*P-preposing in the following cases:

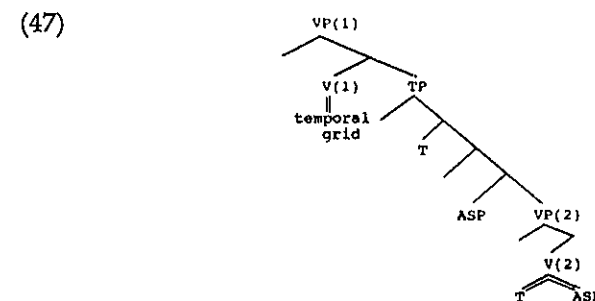
- (46) a. *play handball I see her every day
 b. *wash the car I never let John

These examples could be excluded if the stranded NP is contained in the I*P, as suggested in section 4.1, and has not raised to the matrix object position. The Dutch equivalent of (46) is grammatical (as shown in (45)), because Dutch accusative NPs scramble to a position quite high in the matrix clause, whereas English NPs do not.

It is well known that French and the other Romance languages do not have I*P-preposing. This can in fact be explained if the verb in Romance languages must *always* move to a projection higher than I*: I*P-preposing cannot exist, because there will always be a trace in the head position of I*.

4.4 Licensing of bare VPs

In section 4.1, the V of a bare VP complement was licensed by incorporating to the selecting V at LF (21). How is this licensing formally achieved? And why must causative verbs obligatorily trigger S-structure incorporation? Why does S-structure incorporation versus LF incorporation depend on the licenser? I will try to provide answers to these questions here. Consider the following underlying representation (where V_2 has both an ASP and a T receptor):



At LF, the embedded V, V_2 , moves through the intermediate I projections, and adjoins to V_1 , yielding (48):

The diagram illustrates a hierarchical tree structure for the VP(2) node. The root is VP(2), which branches into V(1) and a series of VP nodes. The first V(1) node branches into V(2) and V(1). The V(2) node branches into T and ASP. The first V(1) node branches into ASP. The second V(1) node branches into a series of VP nodes, which further branch into T and ASP nodes.

But why must causative verbs trigger S-structure incorporation?²³ Suppose that causative verbs have a "defective" temporal argument grid, and that S-structure incorporation represents the means to "repair" this defective grid. Suppose more concretely that causative *make* lacks the I* receptor and that the causative verb is unable to project a well-formed syntactic structure precisely for this reason: it needs an I* receptor to project a well-formed syntactic representation. Because it needs it for syntactic purposes, it needs to get one in the syntax, and the way this is achieved is by raising the I* from its complement in the syntax:

receptor repair

VP

V I*P

T defective receptor I* VP

V

||

represent different categorical projections, ultimately depending on the kind of governing causative verb. This type of account should yield an account for why in language after language the same class of Vs takes this type of complement. The proposal in this paper that causative verbs trigger obligatory S-structure incorporation, but perception verbs, for example, do not, should also yield an account for why causatives typically show up as bound morphemes (triggering obligatory S-structure incorporation), but perception verbs do not. Finally, Sportiche (personal communication) suggests that auxiliary switch in Italian for instance could be treated in a similar fashion: the restructuring verb incorporates some aspectual feature of the lower verb in the syntax, and this is shown by the fact that auxiliary selection is sensitive to the aspectual properties of the lower verb.

Since both Dutch and English causatives trigger obligatory S-structure incorporation, Dutch and English are more similar than previously assumed. The difference between the languages reduces to an independent one: the S-structure position of V. In English, the V cannot reach the I* position governed by the licensing V, therefore there are no overt signs of incorporation at S-structure (other than, maybe, the empty I*s). In Dutch, V moves to I (and C); therefore syntactic incorporation can take place and complex verbs or verbal complexes can show up at S-structure.

Since causatives universally trigger S-structure incorporation, and since the projection of the complement is driven by the lexical properties of the causative, causative constructions provide crucial information as to whether the language allows V-to-I* movement or not. This is a welcome result. Since languages vary with respect to the S-structure position that the verb occupies, one of the language learner's tasks is to find out what this position is. Arguments that allow one to establish this in a particular language often appear difficult to construct.²⁴ This appears to be particularly true for head-final languages. However, if the analysis proposed in this paper is correct, the form of causative constructions becomes extremely important: if causatives involve overt syntactic V-incorporation, the language must have syntactic V-to-I* movement. Only when V can move to I* can incorporation be overtly seen. If the causative does not overtly show V-incorporation, it follows that the language does not allow for V-to-I* movement. This leads us to the following generalization:

(50) Overt V-to-V incorporation iff syntactic V-to-I* movement

Similarly, if perception verbs involve syntactic T-incorporation, and if the language has visible V-incorporation with perception verbs, it follows that the language has syntactic V-to-I*-to-T-movement. If the language has optional incorporation with perception verbs, the language has optional syntactic V-to-I*-to-T movement.

(50) holds more generally: syntactic incorporation (X-movement to a Y head) can only take place if the head can move up to a position governed by the host. Assuming that a lexical category X is governed by a functional one F, it follows that syntactic X movement to Y is only possible if syntactic X-to-F movement is allowed. That is, N can only move out of DP if N to the head position of D is possible in the syntax. P can only incorporate if P can move to the functional projection dominating P in the syntax (cf. Koopman 1991).

5 Licensing heads: N/V asymmetries

We have presented ample motivation for an approach under which a head must be licensed through incorporation. Let us now turn our attention to what can count as a licensing head.

The discussion of bare VP complements in 3.2 led to (22):

(22) V is a licensing head for the head of a bare VP

An examination of those contexts from which bare VP complements are excluded shows that there are restrictions on what element can count as a licensing head.

Bare VP complements are excluded from the complement position of verb-particle combinations (Koopman 1991):

(51) *John made Mary out visit her mother

And bare VP complements are excluded from the complement position of N or P:

- (52) a. *the vision [of John leave]
 b. *my making [of Mary visit her mother every week]
 c. *without [Mary see Bill]

What excludes VP complements from the complement position of verb particles? Kayne (1985) shows that the object of a verb-particle construction is not a direct argument of the verb, but rather forms a projection with the particle. I assume, more specifically, that verb-par-

ticle constructions have the structure in (53), with the complement of the verb-particle combination originating in the complement position of P (see also den Dikken 1990, Koopman 1991, Taraldsen 1983):

(53) V [_{PP} [P [XP]]

As (51) shows, the XP cannot correspond to a bare VP. The V of the bare VP must undergo head movement to V, but will never be able to reach the licensing head V, however, because it can move no further than the governing P. If it is assumed that P is not a licensing head for V, (51) is explained:

- (22) a. V is a licensing head for the head of a VP complement
 b. P is not a licensing head for the head of a VP complement

(22b) also accounts for the ungrammaticality of (52c). It immediately suggests a way to account for (52a) and (52b) as well:

(22) c. N is not a licensing head for the head of a VP complement.

(22) suggests a new account for the well known fact that N and V do not allow for the same range of complements. This asymmetry is generally attributed to a failure of the head N to license an NP with which it has no thematic relation. Kayne (1984), for example, proposes that Ns have different government properties from Vs: verbs can, but nouns cannot, govern across a small clause boundary. Chomsky (1986a) assumes that Ns and Vs have different Case-assigning properties: Ns assign inherent Case, which is subject to the Uniformity Condition on Case assignment, restricting assignment of inherent Case to theta-dependent elements. Verbs assign structural Case which is not subject to this restriction.

The discussion above suggests a different account, however: it is the head of the predicate that fails to be licensed, because N is not a licensing head. Consider the paradigm that needs to be accounted for:

- (54) a. *John_i's belief [_{e_i} to be crazy]
 b. *The belief of John to be crazy
 c. *John_i's likelihood [_{e_i} to be a fool]
 d. *The consideration of John a fool
 e. *The consideration of John foolish
 f. *The call of John up
 h. *My gift of Mary a book
 i. *My claim John is sick
 j. *His taking of advantage of Bill

In (54a)-(54c) the predicates are not headed by C. They are therefore not independently licensed and the V must incorporate to a licensing head, V. The examples are ungrammatical since there is no V available in this structure, and N is not a licensing head.²⁵ AP predicates need to be licensed by incorporating to V and, if we assume the same holds for NP predicates, (54d) and (54e) are excluded because N is not a licensing head. (54f) is excluded if a particle needs to be licensed under incorporation (as argued in Koopman (1991), particles must incorporate at LF). (54h) can be excluded either because it is a small clause predicate (as (54d)), or in the same way as (54f), if double object constructions are actually headed by an empty P (cf. Koopman 1991). Complementizer deletion is unavailable in Ns, suggesting complementizer deletion should be reduced to S-structure incorporation as well. N is not a licensing head for C. Idioms are excluded from complement position of N, suggesting again that the idiomatic part needs to be licensed under incorporation.

Asymmetries in the complement type of Ns and Vs thus reduce to the fact that N is not a licensing head, but V is. This captures an old insight that Vs can trigger incorporation, but other categories cannot. Whether this difference can be further reduced will remain to be seen in future work. An important implication of my analysis is that it obviates the need for the Uniformity Condition, a welcome result.²⁶

My proposal quite generally entails that complements which are not independently licensed by C, like those in (54), are licensed by incorporation to V either at S-structure or at LF. This leads to an incorporation account of raising complements, idiomatic expressions, restructuring constructions (cf. *wanna* contraction), ECM verbs, particle constructions, double object constructions and complementizer deletion.

English allows for P-incorporation (Koopman 1991) in particle constructions, double object constructions, and probably *wanna* contraction, as well as C-incorporation (yielding empty complementizers) and possible ECM verbs. French has neither P-incorporation nor C-incorporation: French lacks particle constructions, double object constructions and empty Cs. This should explain certain differences between French and English first discussed in Kayne (1981) with respect to the existence of verb-particle constructions, double object constructions, and ECM verbs like *believe*. Note that since raising verbs exist in both French and English, both French and English have T-incorporation, possibly because the defective nature of the raising verb forces T-incorporation in the syntax. However, particle constructions, double object constructions, ECM type verbs and C deletion only occur in English,

suggesting that these should all be reduced to cases of syntactic P- and C-incorporation;²⁷ English, but not French, has syntactic P- and C-incorporation.

So far, I have used the impossibility of occurring in the complement position of N as a diagnostic for elements that need to be licensed through head movement to a licensing head. Complements which may occur as complements of Ns (genitive NPs, PPs, tensed CPs and control CPs) need not be licensed through incorporation to N. Discussion in this section has focused on the fact that N is not a licensing head, whereas V is. We have also established that P is not a licensing head for predicates. P, however, is probably a licensing head for NPs, since NPs occur as complements of P. This, of course, raises questions about what precisely determines whether some element is a licensing head, and at which level. I will leave these questions for future research.

6 X⁰ movement to functional categories

Although V-to-I-to-C movement is probably the best studied case of head movement to a functional category, similar arguments can be constructed for LF movement of the lexical category to the highest functional category, F, closing the projection of that category. Consider DPs for example. Recent work on the internal structure of NPs/DPs has shown that DPs are highly structured projections, resembling clausal projections. Universally, the structure of a DP seems to obey the following schema (abstracting from the relative order of elements; NumP stands for Number Phrase) (see Carstens (1991), Ritter (1991), Szabolcsi (1987), Valois (1991) among others):

(55) [_{DP} [_{Spec} [D [_{NumP} Spec [NUM [_{NP}]]]]]

This structure is quite successful in capturing the internal syntax of DPs, such as internal agreement patterns, the distribution of pronouns, the position of different types of adjectives, and extraction possibilities, and also allows space to account for differences between languages which are argued to follow from the position to which the head N moves (see Giorgi & Longobardi (1991), Ritter (1991), and Valois (1991)). In English, it is assumed that the N does not raise (or does not raise very high), just as the V does not raise; in French, the N moves to Num; in Italian, to a position higher than Num. In the Hebrew construct state construction the N moves to D and the genitive is struc-

turally Case-marked in Spec of NumP; in the Hebrew free genitive, the N moves to Num, and Spec of NP is marked with *šel*. However, although the assumption that D is the head of the NP is well motivated and useful in accounting for the internal structure of a NP and observable crosslinguistic differences, it also poses problems: standard tests for establishing what the head is, that is selectional restrictions, show that N, not D, functions as the head of the projection. It must be assumed accordingly that at S-structure the intermediate heads are transparent for government, as Grimshaw (1991) argues for in Extended Projections, although for the internal syntactic structure they are not. This problem can be solved if selectional restrictions do not need to be satisfied at S-structure, but must rather be checked at LF under government (as proposed by Koopman & Sportiche 1989: 584). N-movement into the government domain of the checking V will force N-movement into a position governed by V, the D-position of Num, with NumP moving into Spec of DP. If N moves into D, DPs are headed by N at LF, just as CPs are headed by V. Note also that N's probably have inherent lexical properties, just like Vs: these properties must be satisfied through head movement (forcing movement to the determiner), in the same way as the T-grid of V is satisfied. Similar arguments can be made for the internal structure of APs, if these are also headed by functional categories (for proposals that this is the case for APs, see Abney (1987), Corver (1990), Stowell (1991b) and for PPs see Koopman 1991). Languages differ as to where the head occurs at S-structure. They will be identical, though, at LF, in the sense that all XPs will be headed by lexical categories:

(56) At LF, FPs are headed by lexical categories

S-structure differences with respect to the position of the head disappear at LF. Differences between languages should therefore be explained in terms of S-structure constraints, such as how high the X moves up in the projection.

7 Generalizing incorporation

Verbs have been compared to molecules with a number of slots (the T-grid receptors) that need to be bound. This binding is accomplished by head movement. In the preceding section, I argued that lexical categories which are selected move up into the government domain of their projection so that selection can be satisfied under government. But note now that the head is exactly in the configuration that allows

for head movement. This opens up the possibility that selectional restrictions are also satisfied by incorporation. This suggests that selection and theta-role assignment can also be reduced to head movement (Dominique Sportiche, personal communication).²⁸

Let us explore this possibility further. Assume some standard version of the Projection Principle:

(57) Projection Principle: Lexical properties must be satisfied

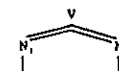
Suppose furthermore that we extend the ideas about licensing of the temporal argument grid, namely that licensing of lexical properties can only be achieved through head movement:

(58) Lexical properties are satisfied through head movement

According to the Projection Principle (which I take to hold at LF), a lexical item is well formed if its lexical properties are satisfied, that is if its receptors are filled (or, maybe, if empty receptors are in an agreement relation with an XP in Spec position, as one might argue for wh-trace or pronouns). The syntactic structure would now follow to a large extent from the fact that lexical properties must be satisfied through head movement.

Let me illustrate these points, starting with a derivation of a verb with a theta-grid consisting of two arguments, N1, the external argument, and N2, a NP internal argument. For ease of exposition, I ignore the T-grid.

(59)



Since the verb has two (N) arguments, these two arguments must be projected in the syntax, so as to provide possible binders for the receptors. Let us assume that they are projected according to a thematic hierarchy, with the external argument the highest. In order for the Projection Principle to be satisfied, N receptors must move onto the verbal molecule. This will force N to move into a DP projection to a position from which it can undergo head movement. There are two ways to achieve this, either by moving N into the D position, or by moving the complement of D, NumP, into Spec of DP, and N to Num.

(60) a. N-to-D movement

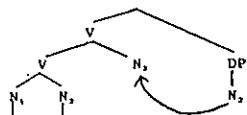
[_{DP} N_i [_{NP} e_i]]

- b. NumP to Spec of DP and N to Num

$$[_{DP} [_{NumP} N_i [_{NP} e_i]] D e_j]$$

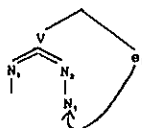
Once in a governed position, N can adjoin to V, which implies V must i-command the DP:

- (61) (First step)



It thus follows that theta-roles must be assigned under government. In the structure in (61), however, the N receptor is not satisfied. This is achieved in a second step in which the head N moves onto the N-receptor. This step is parallel to the one for incorporation of T, discussed in section 3.1 (see in particular (14)):

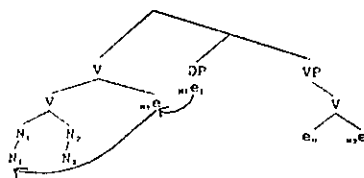
- (62) (Second step; only V-complex is shown):



There are two justifications for the two-steps process. First, both steps exist as the result of overt syntactic incorporation. Incorporation after step 1 (61) yields an adjoined structure from which the head can further excorporate. Incorporation after step 2 yields a syntactically inseparable word. And secondly, the two-step account plays a crucial role in accounting for the binary branching nature of phrase structure (7.1).

How does the selected N move onto the external argument receptor? The V must excorporate and move to a higher V-position from where it governs the DP that corresponds to the external theta-role. As to the incorporation, the two steps described above are repeated: N adjoins to V, and N incorporates onto the open N-receptor:

- (63)



Since the head N must be incorporated, V must be the head governing the DP, i.e. the verb must move to a verbal head position: this has the

nice result of forcing the existence of VP shells.

7.1 Deriving binary branching

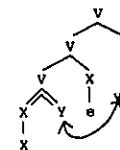
The analysis developed in the preceding section makes theta-role assignment to the external argument no longer exceptional: theta-role assignment reduces to incorporation, and incorporation requires i-command. The verb is thus forced to move to a higher position from where it can incorporate the head of the external argument. A question remains, however: why must the DP carrying the external theta-role occur in a separate VP shell? Why couldn't the structure be flat? This seems to raise the more general question about phrase structure, namely that it seems to be binary branching (Kayne 1984).

Incorporation is possible as long as the head i-commands the incorporee. In principle this allows structures like (64) where the external argument is assigned under V', for example, or any other structure where XP and YP are both internal arguments:

- (64) [V XP NP]

Yet, such structures do not seem to exist. Head movement requires i-command. I-command is respected in (64), and step 1 should therefore derive a licit structure (65):

- (65)



In the next step, however, both X and Y need to move onto the lowest V, since this is the molecule to which the lexical receptors are attached. But in structure (65) only X is an immediate sister to V; Y is not. If only X undergoes head movement in this structure, since only X is the sister of V, a structure like (64) cannot exist: if both XP and YP need to be licensed through incorporation, both XP and YP need to be governed by a head position, i.e. both need to be projected in their own shell. Binary branching structures are thus actually forced for any XP whose head must be licensed through incorporation in order to satisfy lexical properties: there must be as many head positions as there are XPs whose head must be incorporated.

8 Conclusion

In this paper, head movement has been argued to play a central licensing role: head movement represents the way to license heads and is the driving force behind phrase structure. I argued that head movement accounts for the distribution of VPs. If one assumes that the head of a predicate must undergo head movement, the distribution of VP is explained. Moreover, the level at which head movement applies (S-structure or LF) can be determined by examining whether syntactic operations can affect the XP or not. If X undergoes syntactic head movement, the position of XP is fixed in the syntax; if not, XP can appear in an S-structure position that allows for reconstruction at LF. This led to a discussion of bare VP complements in English, where I argued (on the basis of whether VP-preposing was possible or not) that causative verbs in English and in fact universally must trigger S-structure incorporation. I furthermore showed the need to distinguish between licensing heads and non-licensing heads: N/V asymmetries follow from the fact that predicates must be licensed by moving to a licensing head (V), and from the fact that N is not a licensing head for a particular type of head. Finally, I generalized the account and argued that all lexical properties are satisfied by incorporation.

I have attempted to provide answers to a number of questions. Why does V-movement exist? V-movement exists because this is the way by which the inherent lexical properties of the verb are satisfied. At which level must V-movement occur? V-movement must hold at LF for those cases in which V-movement is driven by the satisfaction of the lexical properties of the governed verb. I argued that there is another type of head movement, involved in causative formation of the *make* type, that must universally take place at S-structure. Causative verbs trigger S-structure incorporation, not because the lexical properties of the complement must be licensed (this licensing requirement is satisfied at LF), but because the causative verb itself is defective and needs to incorporate some type of I from its complement. That causatives appear to trigger S-structure incorporation of V is a by-product of V-to-I movement in that language. Languages will have morphological causatives or not depending on whether V must move to I in the syntax or not, yielding a diagnostic criterion for V-to-I movement. What accounts for language variation with respect to syntactic V-movement? The licensing of the lexical properties of V, i.e. of the T-grid of V, was argued to require two steps of head movement: (i) adjunction of the V to a particular I head and (ii) incorporation of the I onto the receptor of the lexical

item. Language variation can now be described as follows: if the verb remains low in its clause, as in English, it implies that the head is stuck in adjoined position, and only (i) has applied. If V moves to a high position in the clause, it must be the case that both steps (i) and (ii) have applied in the syntax. Indications about how high the verb can move exactly come from the S-structure properties of different types of complex verb constructions (causatives, perception verbs, raising verbs and control verbs), in particular the surface shape of the complex verbs, and the syntactic properties of the constructions (restructuring, auxiliary switch etc). In languages in which you always move as high as you can, both steps (i) and (ii) apply in the syntax. The system described in this paper also allows for mixed languages, like Swedish and Norwegian, that allow for both (i) and (ii), but only if V-to-C is forced, otherwise the V basically remains low (you don't apply (ii) in the syntax, unless you have to). What is the reason for head movement in general? Head movement in general exists because this is the means by which lexical properties are satisfied at LF.

In the introduction I outlined a research program reducing primitive relations to movement theory, with two types of movement for licensing purposes: movement to Spec positions and head movement. Questions arise as to the compatibility of both approaches. A first problem arises in the following configuration. Suppose that for Spec-head licensing the complement of X is licensed in Spec of XP but that the head of the complement must also be licensed under head movement. More concretely, suppose that T takes a complement IP, and that this complement is licensed in Spec of TP. The problem that arises is that V must move through the head of IP position to T. Therefore, the head of IP is a trace which is not antecedent-governed by V in T (T does not c-command Spec of TP). Note, however, that both approaches are compatible, as long as V moves on to some higher F projection, from where it can antecedent-govern both the trace of the head in Spec position and the trace of the head in T. Basically then, the end projection can only be one like V (as in (49)) or C, i.e. a position that licenses a particular XP, which is not its complement. Thus both approaches are compatible as long as there is a higher head projection to which V can move.

This paper raises many new questions which I hope to pursue in future work.

Notes

- * An earlier version of this paper was presented at the V-movement conference in Maryland. I would like to thank Norbert Hornstein, David Lightfoot, Juan Uriagereka, Luc Moritz, Tim Stowell and Dominique Sportiche for their comments, questions, and suggestions.
1. This does not apply to Uriagereka (1990) where it is argued that head movement plays an extremely central role. Many of the conclusions that I reach are similar to his but differ in interesting ways. I shall not discuss these differences here.
 2. Step (iia) is also attested in Dutch verb-raising constructions, when an additional verb is added.
 3. It is possible that the structure of VP is universally invariant; what may vary is the position of functional categories (I/C/etc). If this were true, the head initial-/head-final parameter should be restricted to functional categories.
 4. Alternatively, English V might move up a little, but surely not to the highest I category.
 5. But cf. Belletti (this volume) for a proposal that the highest I category (AGR) can be recursive: only auxiliaries may move to this higher empty AGR.
 6. It could be argued that in certain governed contexts the empty I nodes are in fact licensed by incorporation to C at S-structure.
 7. Lexical properties appear to be hierarchically organized with arguments projected in the most deeply embedded shells, the aspectual grid on top of the theta-structure, and the temporal grid on top of the aspectual structure. The question arises why this is so. Dominique Sportiche has suggested to me that the hierarchical position of T with respect to Aspect would follow if Aspect is specified for a T-grid.
 8. A theory of the temporal grid is presupposed. See Stowell (1982) for discussion.
 9. V-to-T movement provides a second argument as to why V must count as the head at this point in the derivation. If ASP were the head in (12), the T head would not be able to attach to the T-receptor.
 10. Fabb argues that bare VPs are licensed (Case-marked) by *ing* in adjuncts of the following kind: *the man buying groceries*. These adjuncts are clausal, however, as Zagana argues, based on the fact that they admit the aspectual *have*.
 11. This does not cover examples like *rather than visit her mother*, as Peter Culicover has pointed out to me.
 12. Uriagereka (1988) also proposes that small clauses are licensed through incorporation. He argues for incorporation by appealing to Baker's (1988) idea that incorporation is an alternative to Case-marking to make items visible.
 13. Note that APs can occur as adjuncts. This shows that the A can be dominated by a functional projection comparable to C which is able to license A independently. As argued in Stowell (1991b), adjectives incorporate at LF.
 14. If verb projection raising in Flemish or Swiss German is indeed VP-raising, it must be assumed that the main verb governs the raised VP at S-structure.
 15. Reconstruction of predicates is forced to the original position, whereas reconstruction of NPs can occur in intermediate Spec of CP positions (Barss (1986), Huang (1991)):
 - (i) a. visit each other_i [I believe [t [they_i did t]]]
 - b. *visit each other_i [they_i believe [t [I did t]]]
 - c. Which pictures of each other_i [do you think [t [they_i like t]]]
 - d. Which pictures of each other_i [did they_i think [t [I liked t]]]
 If the head must be licensed under head movement to a licensing head, reconstruction is forced to the original position. NPs may reconstruct in intermediate positions, basically because the original position can be licensed as a pronoun at LF; there are no pronouns corresponding to V.
 16. I do not distinguish between A and A' positions for the purpose of reconstruction. The logic of this paper requires idiomatic expressions to be licensed through head movement as well. Since an idiom chunk can appear in subject position, *advantage appears to have been taken of John*, reconstruction of the subject must be forced.
 17. (24) yields an account for the impossibility of VP-preposing in, for example, Romance languages. If the verb has moved out of the VP, the projection corresponding to the English VP that could prepose would contain a trace in the head position.
 18. Suppose alternatively that reconstruction does not apply to (25a). Instead, the I categories will move to C at LF, yielding the representation:
 - (i) [visit her mother] did she t
 i.e. the VP is in a Spec-head relation with C, the element that we have assumed licenses the V, and the V can be licensed in this position. Reconstruction must still be assumed, however, given examples like:
 - (ii) [visit her mother] I believe that Mary did
 19. I*P-preposing after passivization is also impossible:
 - (i) * [Visit her mother every week] Mary was made (to)
 No attempt to analyze (i) will be made. The remnant should be head-governed by *to* or by the verb. However, as shown by Zagana (1988a), the infinitival *to* only counts as an appropriate head-governor (in her terms a temporal marker) for an empty VP if it has raised to C of a theta-marked category. This accounts for the following paradigm:
 - (ii) a. And leave John tried to
 - b. *And lie repeatedly John believes Mary to
 - c. *And lie repeatedly John seems to
 20. This argument does not stand if in French the accusative NP does not raise to [Spec, *make*], while it does in English, as argued in Sportiche (1990b).
 21. Syntactic movement of I, although a higher I, is non-problematic and independently observed: cf I-to-C in both main and embedded clauses (SAI), and *to*-to-C, as argued for example in Zagana (1988b), Sportiche (1988) and Lightfoot (1991: ch. 4), and C-to-V movement (see below).
 22. The ungrammaticality of (42) is related to the unavailability of the permissive reading in the source: