Why Kaatje was not heard sing a song

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Introduction

The analysis of the complement structure of perception verbs has developed concurrently with the general development of the theory of generative grammar. However, many questions are still open. Under the NP-S plus Equi analysis (Rosenbaum 1967) as well as under the analysis of perception verb complements as *it*-S/bare S plus subject raising (Kiparsky & Kiparsky 1970, De Geest 1972) it remained mysterious why *Kaatje*, the (derived) object in (1a), could not become the subject under matrix passivization as in (1b). More recently, the bare S analysis without raising to object has gained quite general acceptance. In this analysis *Kaatje* is not a (derived) object, but a subject at all levels of representation. This does not lead to a solution of the ungrammaticality of (1b), either. The construction in (1a) is considered either as an instance of exceptional case marking constructions of which the infinitival complement structure of verbs like *believe* is representative, or as an instance of a Small Clause (cf. Stowell 1981). In either case, the ungrammaticality of (1b) is surprising, given the grammaticality of a passive construction such as (2b), or as (3b):

- (1)a. I heard Kaatje sing a song
- b. * Kaatje was heard sing a song
- (2)a. I believe Kaatje to have sung a song
- b. Kaatje was believed to have sung a song
- (3)a. I consider Kaatje a good singer
- b. Kaatje was considered a good singer

Clearly, the reason for the ungrammaticality of (1b) cannot reside in the semantic nature of the matrix verb, since perception verbs allow passivization with complement types other than bare infinitives, as is illustrated in (4):

- (4)a. The moon was seen rising over the mountain
 b. This song was never heard on the radio before
 c. It was felt that a positive decision would be appropriate

Given the limited distribution of the bare infinitive construction, one might be tempted to treat the ungrammaticality of matrix passivization as an idiosyncrasy. However, the fact that not only in English but also in other languages this construction resists matrix passivization calls for an explanation.

In this paper we shall provide such an explanation. This is embedded in a more comprehensive theory of infinitival complementation, but we shall focus here on those aspects of our theory that are relevant to the analysis of perception verb complements.

In section 1 we introduce the basic explanatory concept of our theory, viz. the requirement of tense linking. In section 2 we discuss briefly the relation between tense and time, capitalizing on the interpretive dependence between embedded tense and matrix tense. We are then in a position to provide an analysis of the complement structure of perception verbs in section 3, and explain why the embedded verb in such constructions has to undergo Verb Raising in section 4. A remarkable property of verb raising constructions is the phenomenon of Infinitive Pro Participio. This property is discussed in section 5. We then have all the ingredients to explain the observation above, i.e. the constraint on matrix passivization which does not permit sentences of the form in our title.

1. Tense and verbs

In recent work, Pollock (1988) has argued for a more articulate structure of clauses. Specifically, he argues that the standard assumption that INFL dominates both Tense and Agr should be revised such that both these elements form their own projection. Taking the COMP-position into account as well, this gives us the following structure of a full clause: ¹

- (5) [_{CP} C [_{TP} T [_{AGRP} AGR [_{VP} V]]] (order irrelevant)
 1 2 3 4

The four different head positions are motivated by different positions that are accessible to verbs at S-structure. The underlying assumption is that a zero-level category may only move to a zero-level category, either through adjunction, or by substitution (cf. Chomsky (1986:71)). Consider the following examples:

- (6)a. (Jean a décidé de) ne pas souvent lire un livre
 b. (Jean a décidé de) ne pas lire souvent un livre
 c. * (Jean a décidé de) ne lire pas souvent un livre
 d. (Jean voulait) n'avoir pas souvent lu un livre
 e. (Jean voulait) n'avoir pas lu souvent un livre
 f. Jean ne lit pas souvent un livre
 g. Lit-il souvent un livre?

In (6a) the verb *lire* is in its base position (position 4 in (5)), taking its NP object as its sister. In (6b), the adverb *souvent* intervenes between V and NP, thus constituting a violation of the adjacency requirement (strict c-command requirement) on Case assignment. Assuming, however, that the adverb is adjoined to VP, we can account for (6b) by moving the verb across the adverb. Given the condition on head movement, its landing site must be a head position. This motivates position 3 in (5). (6c) shows that the lexical verb may not occur in between the two parts of negation in French, at least when the verb is infinitival. (6e) and (6f) demonstrate that this position is accessible to auxiliaries as well as finite lexical verbs, which motivates position 2 in (5). Finally, (6g) shows that under certain circumstances, the verb may even move further to the left of the subject. This is the well-known Verb-Second phenomenon, which involves movement to the COMP-position. This motivates position 1 in (5).

Many issues are raised by the structure in (5) that we cannot go into in this paper. Clearly, languages vary with respect to which positions are accessible to which verbal elements, and with respect to which movements are obligatory and which are optional. In Italian, for instance, not only infinitival auxiliaries, but also infinitival lexical verbs move to position 2, as is illustrated by the contrast in (7). In English, on the other hand, lexical verbs may only occur in position 4 (8), whereas infinitival auxiliaries may occur either in position 3 or position 2, as is shown by the examples in (9).

- (7)a. (Jean a décidé de) ne plus aller à l'école
 b. * (Jean a décidé de) n'aller plus à l'école
 c. * (Gianni ha deciso di) non più andare a scuola
 d. (Gianni ha deciso di) non andare più a scuola
- (8)a. (John wants) to not/often go to school
 b. * (John wants) to go not/often to school
- (9)a. (John claimed) to not have gone to school
 b. (John claimed) to have not gone to school
 c. (John claimed) to often have read this book
 d. (John claimed) to have often read this book

Not only finite verbs, but also infinitival ones are subject to rules of V-movement. This movement moves V to AGR, T or C. The application of V-movement is sometimes blocked (cf.7a,b), sometimes optional (cf.9a,b) and sometimes obligatory (cf.7c,d). The question arises, of course, which factors are responsible for the application of the rule of V-movement in specific circumstances. In our view the main reason for the occurrence of V-movement rules is the condition in (10).

(10) T-linking

A verb must be identified by Tense

The notion Tense in the hypothesis in (10) applies to both finite and infinitival Tense. The condition in (10) might be a consequence of the θ -criterion if we assume that each verb contains an event position in its θ -grid. In order to satisfy the θ -criterion the event position must be saturated. One might then invoke the mechanism of θ -binding proposed by Higginbotham (1985). We will not develop this idea any further here. We shall conceive of Tense as an operator that takes a verb as its scope-bearing element (cf. Evers 1981). What we want to propose is that the Tense and the Verb are related by means of a chain that involves the positions in (5), i.e. these positions are part of what we shall henceforth call a T-chain (cf. Guéron & Hoekstra 1988). Just like A-chains and A'-chains, T-chains have to meet the ECP, i.e. each link in the chain must antecedent-govern the next link, or, phrased differently, intervening heads may not be skipped (cf. Baker 1985, Chomsky 1986). A T-chain thus has the form in (11), where each P is locally connected to the next:

(11) (Tense, P_1 , ..., P_n , V)

T-chains may vary across languages on two parameters:

- a. the base position of Tense
- b. the way in which the chain is established: by Verb movement or by percolation

Following Den Besten (1981), we shall assume that the base position of Tense in Verb Second languages is COMP, whereas in a language such as English, Tense is base generated in position 2 in (5). The second parameter is similar to the WH-movement parameter: either the scope-bearing element (the WH-phrase) moves to the operator position in the syntax, or a percolation relation is established between the operator and its scope-bearing element. Both relations are subject to the ECP, as is the formation of a T-chain. To illustrate the second parameter, consider the contrast between Icelandic and Swedish in (12).

- (12)a. að hann keypti ekki bókina (Icelandic)
 that he bought not the-book
 b. att han inte köpte boken (Swedish)
 that he not bought the-book

There are in principle various ways in which the different order of finite verb and negation can be accounted for. However, examination of the position of negation across languages would suggest that negation is not to be considered a modifier of VP, but rather a modifier of INFL. The simplest way to account for the difference between Icelandic and Swedish would therefore seem to be that both languages have the base structure in (13), the difference being a consequence of verb movement to P2, via P3, in Icelandic, but not in Swedish.

(13) C [_{TP} P₂ NEG [P₃ [_{VP} V NP]]

The only way the V in Swedish can satisfy the condition on T-linking in (10) is by percolation of Tense from P2 to P3, followed by either percolation from P3 to V or by movement from V to P3.

We have now set out the basic assumptions that are required for an account of the contrast in (1). It should be borne in mind that the empirical scope of this theory is much wider than presented here. A complete account of the theory and its consequences will be published elsewhere. In this article we present our theory in as far it is relevant for the explanation for the contrast in (1). To summarize: verbs must be linked to tense by means of a T-chain, consisting of Tense as the head of the chain, and V as its foot, and several intermediate head positions, such that each link of the chain is locally related to the next, as a consequence of the ECP. Tense may either percolate down to its scope bearing element along the T-chain, or the scope bearing element may move upwards.

2. Tense and time

Up to this point we have not paid any attention to the semantics of tense. Although a full discussion of this intractable matter is clearly beyond the scope of this paper, there are a few things we should say. In the normal case, the tense of a simplex sentence anchors the temporal reference of the event on the time of the utterance. This is not the case for the tense of embedded clauses: their temporal anchoring is dependent on the temporal anchoring of the matrix tense, among other things (cf. Eng 1987). In our theory this interpretative dependence has a syntactic correlate in the sense that the T-chain of an embedded clause must be locally connected to the T-chain of its governing domain. We refer to this as T-chain composition, which is formulated in (14).

(14) T-(chain) composition

If C_1 is the chain of a dependent T and C_2 is the chain of the governing T, then C_1 and C_2 can be composed iff some link of C_1 is a sister to some link of C_2 .

Let us illustrate this condition with a simple example from Dutch. In Dutch, T-linking is established by Verb movement, as can be seen in (15). The obligatory nature of this movement rule derives from the fact that no percolation to the V-position is possible. This implies that the D-structure position of V is not a link in a T-chain: tense lowers to T, which is thus the foot of the T-chain, to which the verb has to move in order to be linked. If V has a sentential complement, the following situation obtains. The embedded clause in (16a),

In English, on the other hand, the T-chain is established through percolation to the Verb in its D-structure position, which is therefore a link in the T-chain. Hence, no extraposition is forced in the English counterpart of (16). This difference between Dutch and English will turn out to be very important, as we shall see below.

3. AGR-phrases

The separation of Tense and AGR proposed by Pollock makes it possible to provide a solution of a problem concerning small clauses. Ever since the introduction of the concept of small clauses, i.e. the hypothesis that the bracketed parts in examples such as (18) form constituents, there has been discussion as to the precise nature of this constituent. Either the constituent is regarded as a projection of the head of the predicative expression, i.e. X is AP in (18a), but PP in (18b), or it is conceived of as a reduced S, i.e. an IP.

- (18)a. I consider [_X John foolish]
 b. I want [_X John off my ship]

The former assumption (cf. Stowell (1981)) meets with serious problems:

- it requires a cross categorial definition of subject, which gives a problem in cases such as *I consider John Peter's best friend* where the NP would have two subjects;
- it is inconsistent with the principle that only heads and maximal projections are visible for move- α . For a construction such as *On which ship do you want Bill?* it has to allow for the movement of intermediate projections;
- it wrongly predicts that small clauses have not PRO subjects, at least according to the Aoun/Sportiche definition of government, since the subject position would be governed from inside.²

The reduced S or IP analysis (cf. Chomsky (1981)) can maintain the standard subject definition (i.e. [SPEC,IP]), but it also faces difficulties:

- if the reduced S is a barrier, there are no specific problems with the occurrence of PRO-subjects.³ However, SCs with lexical subjects then constitute a problem.

- the latter problem can be solved if it is assumed that IP is transparent to government from outside, for instance on the basis of the stipulation that IP is defective with respect to barrierhood. However, under that assumption, SCs with PRO subjects constitute a problem.
- a further drawback is that small clauses, although showing agreement in many languages, do not seem to have any tense.

The advantages of a clausal analysis can be kept, however, under Pollock's proposal if we assume that SC's are AGRP's: clauses that lack tense. The distribution of PRO vs. lexical/trace subjects in SCs simply follows from L-marking: if the AGRP is a complement (θ -marked), it will not be a barrier, hence government is allowed, whereas if AGRP is an adjunct, it will be a barrier by virtue of not being L-marked. From here on we will assume that all subject-predicate relations have the form of an AGRP, with the complement of AGR as the predicate and the specifier of AGR as the subject. This AGRP can occur in the complement of a T-position, in which case we find a regular case of predication. It may also appear in the complement of a verb or as an adjunct. In these cases we have instances of secondary predication.

- (19)a. I consider [John foolish]
 b. I kicked [him off the street]
 c. I heard [John sing a song]
 d. I made[John angry]
 e. I made[John leave the building]
- (20)a. John was considered [*t* foolish]
 b. He was kicked [*t* off the street]
 c. * John was heard [*t* sing a song]
 d. John was made [*t* angry]
 e. * John was made [*t* leave the building]

In (19) examples are given with SC-complements, to which we shall henceforth refer as AGRP-complements, in accordance with the claim that tenseless complements are clauses without the T-position. Such AGRPs may have complements of various categories: in (19a,d) an AP, in (19b) a PP and in (19c,e) a VP. The claim that such complements lack a T-projection explains a number of the properties of these complements that have often been noted in the literature.

- it accounts for the specific temporal interpretation of Small Clauses. In (19), the state or event expressed in the AGRP holds at the moment at which the matrix event holds. This is a property found with all non-finite complements of perception verbs (cf. de Geest 1972).
- de Geest (1972:ch. 4) notes that infinitival complements of perception verbs cannot contain a clausal negation, nor any other sentence-level adverb, such as speaker-oriented or modal adverbs. With respect to (13) we argued that negation should be generated outside AGRP. Also, it is well-known that a test for this category of adverbs is that they allow a paraphrase of the type in (21b), in which the tense of the matrix is independent of the tense of the embedded verb:

- (21)a. John probably goes/went home
 b. It is probably the case that John goes/went home

This paraphrase property can be made sense of if it is assumed that these adverbs are modifiers of the T-projection. If that is correct, the fact that these adverbs cannot be found in the infinitival complement of perception verbs supports our claim that these complements lack a T-position entirely.⁴

Adopting the AGRP status of the infinitival complement in (19c,e), on a par with the other complement structures in (19), we are confronted with a problematic asymmetry in passivization of the matrix in (20). Whereas passivization is allowed in case AGR has an AP or a PP complement, it yields an ungrammatical result in (20c,e), where the complement is verbal (VP).

If the complement of V is not AGRP but TP, which is the case in to-infinitivals with a lexical subject, i.e., verbs of the *believe*-type, passivization does not lead to ungrammaticality. This is shown in (22).

- (22)a. Ben believes [_{TP} Joe to win the race]
 b. Joe was believed [_{TP} *t* to win the race]

From (19) and (22) it follows that the impossibility of passivization in (20c,e) cannot be due to a general impossibility of NP-movement of the subject of an embedded clause, either an infinitival clause (TP) as in (22) or a small clause (AGRP) as in (20a,b,d). It thus appears that we cannot restrict NP-movement in

a non-ad-hoc manner from applying in (20c,e). We will indeed argue that the ungrammaticality of (20c,e) does not reside in the impossibility of NP-movement.

When we turn to Dutch, we note that the facts are almost identical. The verb *vinden* ('find', 'consider') may take an AGRP-complement containing an AP in (23a), an NP in (23b) or a VP in (23c). Note, however, that in the latter case Verb Raising applies, shifting the head of the complement to the right of the governing verb. As in English, matrix passivization is possible in the first two cases, but not when the AGRP has a VP complement, as is shown by the examples in (24).

(23)a.	dat ik [Jan vervelend] vind	(that I John boring find)
b.	dat ik [Jan een idioot] vind	(that I John an idiot find)
c.	dat ik [Jan t_i] vind zeuren _i	(that I John find nag)
(24)a.	dat Jan vervelend werd gevonden	(that John boring was found)
b.	dat Jan een idioot werd gevonden	(that John an idiot was found)
c.	* dat Jan werd gevonden zeuren	(that John was found nag)

Before explaining this asymmetry in matrix passivization, we shall first develop an analysis of Verb Raising.

4. Verb Raising

Descriptively the basic facts about Verb Raising in Dutch (and German⁵ are as follows:

- Verb Raising leads to a situation in which the verb of an embedded sentential complement is adjoined to its matrix-verb: (25a,b)
- Verb Raising applies only if the embedded complement is infinitival: (25c)
- Verb Raising applies only if no Extraposition takes place: (25d)
- Verb Raising applies only if the infinitival complement has no lexical complementizer: (25e)
- If no Extraposition takes place, Verb Raising as in (25b) is obligatory
- If the matrix verb is a modal verb or a perception/causative verb (i.e. if the matrix verbs selects a *te*-less infinitival clause), only Verb Raising is possible: (26)-(27)
- If the complement has *te*, Verb Raising is optional in most cases (28)

- (25)a. * dat Jan [(om) een appel te eten] belooft D-structure
 that John an apple to eat promises
- b. dat Jan [een appel *t*] belooft *te eten* Verb Raising
 that John an apple promises to eat
- c. * dat Jan [dat hij een appel *t*] belooft *zal eten*
 that John that he an apple promises will eat
- d. * dat Jan belooft *te eten* [(om) een appel *t*]
 that John promises to eat an apple
- e. * dat Jan [om een appel *t*] belooft *te eten*
 that John for an apple promises to eat
- f. dat Jan belooft [(om) een appel te eten] Extrapolation
 that John promises for an apple to eat
- (26)a. * dat Jan [een appel eten] moet D-structure
 that John an apple eat must
- b. dat Jan [een appel *t*] moet *eten* Verb Raising
- c. * dat Jan moet [een appel eten] Extrapolation
- (27)a. * dat Jan [Marie een appel eten] hoort/ziet/laat D-structure
 that John Mary an apple eat hears/sees/let
- b. dat Jan [Marie een appel *t*] hoort/ziet/laat *eten* Verb Raising
- c. * dat Jan hoort/ziet/laat [Marie een appel eten] Extrapolation
- (28)a. * dat Jan [een appel te eten] probeert/belooft/zegt D-structure
 that John an apple to eat tries/promises/tells
- b. dat Jan [een appel *t*] probeert/belooft/zegt *te eten* Verb Raising
- c. dat Jan probeert/belooft zegt [een appel te eten] Extrapolation

In section 3 we argued that Extrapolation of finite complements is required in order to establish a connection between the Tense of the embedded clause and the Tense of the matrix clause. We considered this to be the syntactic correlate of the interpretative dependence of the embedded temporal specification on that of the matrix. In our theory of Tense the finiteness of a verb is irrelevant. The ungrammaticality of the sentences with infinitival complements without Extrapolation or Verb Raising (i.e. (25a), (26a), (27a) & (28a)) can thus be accounted for in the same way, in that the T-chain in the embedded clause cannot be composed with the T-chain in the matrix clause (cf.(14)). Given the acceptability of (28b) and (28c), it must be concluded that successful T-composition can be established by either Extrapolation or Verb Raising in the case of an infinitival complement. Thus, the requirement to apply VR or

Extrapolation in Dutch follows from the same principle. The fact that English does not require Verb Raising and optionally allows Extrapolation follows from the claim that T-composition can be established without movement.⁶

Now that we know why Verb Raising applies, we should provide a more detailed analysis of how it applies. From the facts in (25)-(28) it is clear that Verb Raising implies movement of the verbal head of a complement (in most cases together with *te*). As argued above, it follows from the ECP that head movement is strictly local. No intervening heads can be skipped. Movement of a verb to a position outside the CP in which it originates thus involves movement from V to AGR, from AGR to T, from T to C and from there to the first head-positions outside CP (i.e. the V position of the matrix clause). From the well-known discussion on the Verb Second phenomenon it is clear that movement to C is an instance of substitution. The complementary distribution between finite verb and complementizer can be explained along these lines. The impossibility to apply VR in finite complements (25c) or in infinitival complements with a lexical complementizer (25e) follows for the same reason. Finite complements have to be introduced by a lexical complementizer in Dutch. The complementizer blocks the application of movement to C. In those cases Extrapolation is obligatory.

The ungrammaticality of Verb Raising from an Extrapolated complement (25d) also follows from the theory of head movement. First, the application of Extrapolation removes the motivation for the application of Verb Raising, since the embedded T-chain is already composed with the matrix T-chain via Extrapolation. Second, Extrapolation involves adjunction of CP to the matrix TP. If the verb has been moved to C within the extrapolated CP, there is no longer any possibility to move up to a head position without violating the locality condition of the ECP. This also holds for base generated adjunct clauses, which for this reason do not allow Verb Raising either.

The same line of reasoning explains why Verb Raising is restricted to complements of V, i.e. why it does not apply to complements of categories other than V. In the case of complements of P, N or A, the verb after being moved to C, either raises to a non-T-link, or passes a head. In the former case, no T-linking is established, while in the latter case an ECP-violation results as a consequence of the intervening head, i.e. the head which is skipped. We thus

have a principled explanation for the limited distribution of bare infinitive clauses, i.e. these can occur only in the complement position of verbs.

We saw that T-composition can be established either by movement of the whole complement to a position in which the head of the embedded T-chain can be locally composed with the T-chain of the matrix clause (Extraposition), or by movement from the foot of the embedded T-chain into the matrix clause (VR). We now have to answer the question why Verb Raising is obligatory in *te*-less complements. We will concentrate on perception verbs only. The answer is quite straightforward. As argued in section 3, perception verbs take an AGRP as their complement, with VP as the complement of the AGR-head. Among other things, this accounts for the fact that no lexical complementizer and no lexical realization of T (i.e. *te*) are possible in an infinitival complement to a perception verb. If the infinitival complement is AGRP, the complement has no internal Tense position. It thus follows that no well-formed T-chain can be established within the infinitival complement. For the embedded verb to satisfy the condition on T-linking in (10) the verb should be moved into the matrix clause. Only then can the embedded verb be related to Tense. In this case VR is necessary to establish T-linking. No extraposition is possible, since the complement has no internal T-chain satisfying (10). We see that VR applies either to satisfy T-linking (if the complement has no internal tense) or T-composition (if the complement has an internal tense), whereas Extraposition can only take place in case of T-composition.

Summarizing, the theory of Tense which includes Tense-linking and Tense-connection allows an explanation of why, how and when Verb Raising applies in Dutch. For our purposes here the most important conclusion is that in perception verb complements the embedded verb has to be moved into the matrix clause in order to satisfy the condition on Tense-linking.

5. Past Participles and the IPP-effect

A very interesting phenomenon in Dutch is what is generally referred to as Infinitivus Pro Participio (IPP). This refers to the fact that in Verb Raising constructions an infinitive is used where a participle is expected. An illustration is given in (29).

- (29)a. dat Jan deze kaas heeft geprobeerd/*proberen
that John this cheese has tried/try
- b. dat Jan heeft geprobeerd/*proberen [deze kaas te eten] Extraposition
that John has tried/try [this cheese to eat]
- c. dat Jan [deze kaas *t*] heeft proberen *te eten* Verb Raising
that John this cheese has try to eat

The IPP-effect, shown in (29c), appears in Verb Raising contexts only. This effect is obligatory in those cases in which Verb Raising is obligatory as well, as is demonstrated in (30).⁷

- (30)a. dat Jan mij heeft gehoord/*horen
that John me has heard/hear
- b. dat Jan [mij een liedje *t*] heeft *gehoord/horen *zingen*
that John me a song has heard hear sing
- c. dat Jan die auto altijd al heeft gewild/*willen
that John that car always has wanted/want
- d. dat Jan [die auto *t*] heeft *gewild/willen *kopen*
that John that car has wanted/want buy

The data in (30) demonstrate two things. First, Verb Raising results in a cluster of the lower verb and the matrix verb, and, second, Verb Raising cannot move the verb to a participle.

The fact that (30b,d) represent the only possible outcome indicates that Verb Raising must apply. The reason is that the embedded Verb (*zingen*, *kopen*) must be T-linked. The occurrence of the IPP-effect then illustrates that the embedded verb can be T-linked only by movement to a V position which does not contain a participle. Apparently, participles cannot be links in a T-chain.⁸ The ungrammaticality of (30b,d) with a participle follows from the fact that movement from the C-position to the first available position in the matrix clause (AGR) violates the condition on locality of head-to-head movement. The only way to get a grammatical result for sentences such as (30) is to keep the matrix verb in its infinitival form. Infinitival verbs can be links in a T-chain. Consequently, the embedded verb can be adjoined to the matrix verb and together they can be adjoined to the auxiliary verb in T, thereby creating a T-link for both verbs.

6. Passive Participles and T-linking

After this discussion we can provide an explanation for the impossibility of passivization of the subject of AGRP if the complement of AGR is VP. This situation is illustrated for English in (31a) and for Dutch in (31b).

- (31)a. * Kaatje_i was heard [_{AGRP} t_i [_{VP} sing a song]]
 b. * Kaatje_i werd [_{AGRP} t_i [_{VP} een liedje t]] gehoord *zingen*/horen *zingen*/
 zingen gehoord/*zingen* horen

We will start with the explanation of the Dutch examples in (31b). We can distinguish between the construction in which the matrix verb is a passive participle and in which it is an infinitive. If the matrix contains a passive participle the explanation for the ungrammaticality in (31b) is similar to the explanation given in the previous section with respect to incompatibility of Verb Raising with a matrix past participle. The embedded verb (*zingen*) should be linked to tense. The AGRP has no internal tense. For the embedded verb to become linked to tense, it has to be related to the tense of the matrix clause. Given the fact that T-linking of verbs in Dutch is established through movement, the verb should move to a position in which it can be related to the matrix tense. This is the matrix T-position. However, movement to this position has to go via the matrix V-position. A V-position occupied by a (passive) participle is not a possible link in a T-chain. It thus follows that movement of the embedded verb to the matrix T-position leads to ungrammatical results. With past participles the participle could be replaced by an infinitive. As we can observe in (31b), this is not a possible solution with passive participles. We may consider the IPP-effects as a marked rule of deletion of participial morphology. In the case of past participles no irrecoverable material is deleted by leaving out the participial morphology. In the case of passive participles we may consider the participial morphology to be the bearer of the external thematic role (cf. Roberts 1987, Hoekstra 1986). Deletion would violate the principle of recoverability of deletion. We thus explain the ungrammaticality of (31b) completely in terms of T-linking.

For (31a) a similar explanation can be presented. The embedded AGRP has no internal tense. The embedded verb has to be linked through a T-chain with the matrix tense. In English T-linking is established through percolation. We argued that percolation creates a T-chain. This implies that T-percolation is subject to the same locality restrictions as V-movement. If the passive participle is not a possible T-link,⁹ percolation cannot reach into the AGRP. The consequence is that V in the embedded AGRP violates the condition that each verb should be linked to tense. We thus see that the occurrence of the passive participle blocks both V-movement in Dutch and T-percolation in English. The result is that both languages do not allow passivization of the subject of an infinitival complement to a perception verb as a result of the condition on T-linking in (10).¹⁰ This is our answer to the central question of this article.

A striking confirmation of the correctness of a theory in which the presence of a participle is crucial in explaining the facts in (31) can be found in Swedish. In Swedish there are two types of passivization. The first type makes use of a passive inflection on the main verb and the second type is similar to the passive in Dutch and English in using an auxiliary verb and a passive participle. Interestingly, passivization of the type in (31) is possible only in the first case, as shown by (32b) and not in the second, as illustrated in (32c). This pattern follows directly from our theory. In (32b) T-percolation (or V-movement) is not blocked and the embedded verb can be linked to tense. In (32c) the passive participle in the matrix V-position blocks T-linking.

- (32)a. Jag hör Peter sjunga en sang
 I hear Peter sing a song
 b. Peter hördes sjunga en sang
 Peter was heard sing a song
 c. * Peter blev hörd sjunga en sang

Notes

1. Belletti (1988) adopts a similar complex structure for IP, which differs from Pollock's proposal in an essential way. Whereas Pollock assumes that T dominates AGR, Belletti holds the opposite position that AGR dominates T. The analysis that we provide in section 3 is consistent with Pollock's proposal. See footnote 4.

2. In order to solve this problem, Stowell proposes that heads govern in one direction only. This directional theory of government thus implies that the subject of a SC is not governed by its head. However, this does not solve the problem, because Stowell also assumes that heads may govern into other projections, up to the point where the governing capacity of the head of that projection starts. Hence, the PRO subject of an adjunct SC would still be governed, not by the head of the SC, but by whatever dominates the SC. Apart from this, Stowell's directionality proposal only works in a language such as English where SPEC and complement are on different sides of the head, but not for languages, such as Dutch, in which these occur on the same side of the head.

3. There is of course the general problem that the occurrence of PRO subject presents for a theory that adopts both the Aoun/Sportich definition of government and the PRO-theorem that PRO must be ungoverned. This result can be obtained only if it is furthermore assumed that I, the head of IP, does not act as governor when Tense is absent, i.e. in *to*-infinitives. This assumption itself, apart from being rather unnatural, runs into problems with VP deletion as in (i)

(i) ... and John decide to [_{VP}e] as well

If the head of IP is not a governor in this case, the empty VP would be ungoverned as well.

4. Note that these consequences of the analysis of small clauses as AGRPs cannot be obtained in a straightforward fashion under Belletti's proposal mentioned in note 1.

5. It is often assumed that Dutch and German are entirely similar with respect to infinitival complementation, the only difference being that the embedded infinitive shifts to the right of the matrix verb in Dutch, whereas it remains to the left of the matrix verb in German. Closer examination reveals, however, that both extraposition and V-raising are optional in German, i.e. German seems to allow preverbal complement clauses. It would take us too far afield to illustrate this in some detail here. We shall discuss these matters further in Bennis & Hoekstra (to appear).

6. Not only is Verb Raising not required in English, it is also impossible, a fact that also has to be explained. The reason for this impossibility is the same as for the general impossibility of English verbs to leave VP. It is interesting to note that Verb Raising in the development of English became impossible at approximately the same time as the rise of the modals and the introduction of *do*-support.

7. An interesting question is whether the IPP-effect is obligatory in all VR-constructions. Although (i) seems to point to optionality (cf. (29c)), this is only apparent. It can be shown that in sentences as (i) the rule moving the verb to the left is different from Verb Raising.

- (i) a. dat Jan [een boek *t*] heeft geprobeerd/proberen *te lezen*
 that John a book has tried to read
 b. dat Jan Piet [dat boek *t*] heeft gedwongen/dwingen *te lezen*
 that John Peter that book has forced to read

These sentences seem to show VR with a participle in the matrix clause. These sentences do not involve cluster formation between participle and embedded verb, as can be seen in (ii).

- (ii) a. dat Jan [een boek *t*] geprobeerd heeft *te lezen* (cf.(ia))
 b. dat Jan Piet [dat boek *t*] gedwongen heeft *te lezen* (cf.(ib))

A separation of matrix verb and embedded verb is not possible in clear cases of VR, nor in sentences of the type in (30), as is shown in (iii).

- (iii) a. * dat Jan [een boek *t*] proberen wil *te lezen*
 that John a book try want to read
 (cf. dat Jan een boek wil proberen *te lezen*)
 b. * dat Jan [mij een liedje *t*] horen/gehoord heeft *zingen*
 that John me a song hear/heard has sing
 (cf. dat Jan mij een liedje heeft horen *zingen*)

Moreover, sentences such as (i) appear only with matrix verbs which allow Extraposition of the complement. Just as Den Besten et al. (1988) we will assume that (i) is not an instance of VR, but rather a special case of VP-extraposition.

8. We stipulate here that participles are not possible T-links. Optimally, this notion should be made to follow from more general principles. These should also be capable of distinguishing between past participles in Dutch and those in e.g. English. Following ideas of Pollock (1988) we might relate this difference between Dutch and English to the different ways in which participles are generated by the grammar: in Dutch by means of adjunction of the verbal stem to the participial affix, in English by affix hopping (lowering). Pollock suggests that the head of the morphological complex created in these ways differ: the affix is the head in Dutch, but either the verb or the affix in English.

9. It is necessary to make a distinction in English between past participles, which are possible T-links (cf. note 8) and passive participles, which are not. Such a difference is independently motivated, e.g. by the possibility of *that* deletion, where past participles function as verbs in allowing *that*-deletion, while passive participles function as non-verbal governors in not allowing it. We would like to claim that passive participles have nominal properties, contrary to past participles. This nominal character must be due to the participial affix, which we take to instantiate an argument of the verbal base. Given that the category of a morphological complex is determined by the head, it must be concluded that in passive participles, the affix is the head.

10. Note that both languages do allow passivization of the subject of a TP-complement, as in (i).

- (i) a. John_i was believed [t_i to have left]
 b. Jan_i werd verondersteld [t_i naar huis te gaan]
 John was supposed home to go

In those cases the infinitival complement has an internal T-position. Therefore, the embedded verb satisfies the condition on T-linking within the complement. The condition on T-composition can be satisfied through Extraposition. This makes the status of the passive participle irrelevant. Much more can be said about the construction in (i). For a discussion we have to refer to Bennis & Hoekstra (to appear).