# Where Does *To* Come From*

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## 1. Perception Verbs and the *To*-Mystery

Perception verbs are considered to be among those troublesome phenomena which have resisted neat grammatical analysis. To take a case in point, consider the following facts:

(1) a. We saw John leave early.
b. *John was seen leave early.
c. John was seen to leave early.[1]

The active sentence in (1a) shows the existence of perception verb complements in which the verb form is bare infinitival (i.e., *leave*). We will be concerned in this paper primarily with this type of perception verbs (IPVs; that is, perception verbs with a bare infinitive as their complement verb, such as *see, hear,* etc.). One of the puzzling facts is that *to* has to be present when the subject of the complement is moved as a result of Move $\alpha$, giving the grammaticality/ungrammaticality judgment as in (1b, c). We will call this phenomenon the *To*-Mystery. Gee (1977) cites Emonds' (1976) argument that IPVs have had *to* deleted, since it shows up systematically when you passivize the subject as in (1), adding that *to* does show up in some active sentences as in (2):

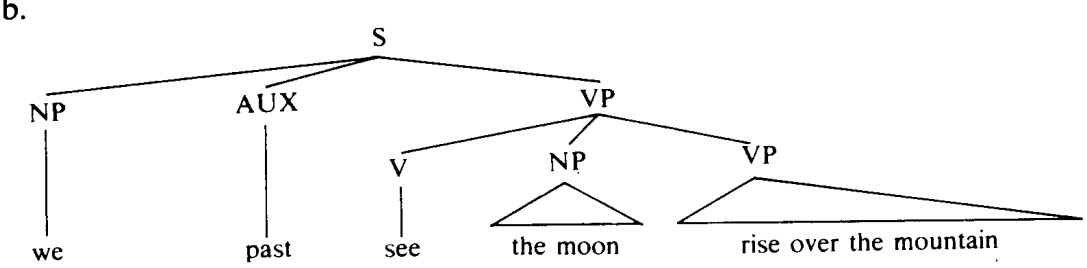
(2) a. We all saw John to be suicidal on that occasion.
b. *We all saw John (be) suicidal on that occasion.

Before getting to (1) and (2) and assessing the validity of Emonds' argument, we will briefly see how Akmajian (1977) and Gee (1977) analyzed the complement structure of IPVs.

Akmajian (1977) takes the D-structure of (3a) to be (3b):

(3) a. We saw the moon rise over the mountain.

b.




Akmajian proposes D-structures such as (3b) for IPVs on the basis of the nonconstituenthood of IPV complements, as can be seen in the following:

(4) a. *What we saw was Raquel Welch take a bath.

b. *It was Raquel Welch take a bath that we saw.

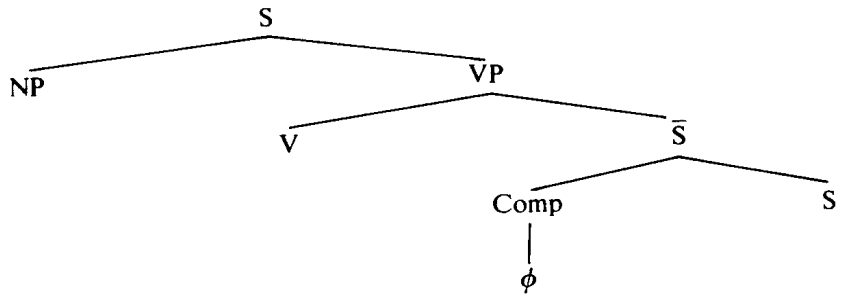
c. *?We could hear, but we couldn't see, Raquel Welch take a bath.

d. *Raquel Welch take a bath is a breathtaking sight to see.

e. *Raquel Welch take a bath has been witnessed by many a movie-goer.

Gee (1977), however, considers the relevant structure for IPVs to be the following:

(5)




Here are some of the examples that Gee has given as evidence supporting his point:

(6) a. We saw it rain.

b. I've never seen there be so many complaints from students before.

c. I would like to see it (be) proven that John was there that night.

d. I've never seen John be so easy to please before.

e. I've never seen John appear [seem] to be so out of it before.

f. I saw John want to be President so bad that he could taste it.

g. *We saw Mary kiss each other.

h. *I saw Mary kiss myself.

We conclude mainly on the basis of Gee (1977) (without much argument of our own) that IPV complements form constituents and that they are S-type complements.[2] As for the evidence presented by Akmajian (1977) for the nonconstituenthood of IPV complements, it seems that (4a, b, d, e) are all explained by $\theta$-theory, *Raquel Welch* being assigned no Case and thus violating the $\theta$-Criterion.[3] Haraguchi (1983) cites some examples in which Right Node Raised elements do not form a constituent and comments that it is too much to assert that Right Node Raised elements always form a constituent, and if this is correct, (4c) cannot be evidence supporting the nonconstituenthood of its complement elements.

Now we are in a position to consider Emonds' (1976) argument cited above that IPVs have had *to* deleted since it shows up systematically when you passivize the complement subject (see (1)). According to Emonds (1976), the D-structures of (1a, c) would contain *to,* and it would have to be deleted in the active case ((1a)) while it would have to remain in the passive ((1b, c)). Moreover, there are some examples where *to* must not be deleted even in active cases (see (2)). We assert with Harakawa (1983) that one major difference between (1a) and (2a) is that between direct (physical) and indirect (mental) perception. Harakawa cites Palmer's claim that sentences such as (1a) in which *see* takes a bare infinitive as its complement verb denote direct perception while their passive counterparts such as (1c) where *to* appears show indirect perception. Then (1c) should be treated on a par with (2a) with respect to the direct/indirect distinction, the presence of *to* being crucial. Now we see that it would be difficult for Emonds to formulate a deletion rule in the general framework of Chomsky and Lasnik (1977) that would make a fine semantic distinction so as to make both (1a) and (2a) grammatical. The semantics would not be able to make the necessary distinction between (1a) and (2a) since *to* would also be present in the case of (1a) in the LF component. We assume from these considerations that Emonds' (1976) argument cited above is untenable and that some other alternative should be sought to cover these cases.

First, we assume that the difference (the presence/absence of *to*) between (1a) and (2a) should be represented in the lexicon and that *see* has the following two strict subcategorization frames, among others:[4]

(7) a. *see* : +V, +_____$[_{\bar{S}} \ldots [_{INFL}\ e] \ldots]$

b. *see* : +V, +_____$[_{\bar{S}} \ldots$ *to* $\ldots]$

(7a) is the subcategorization frame responsible for sentences such as (1a), whereas (7b) is connected with (2a). The semantics will somehow interpret the relevant sentences so that (1a) may be linked to the notion of direct perception and (2a) to that of indirect perception.

We ascribe the presence of *to* in (1c) to a (marked) insertion rule of syntax and propose the following optional *to*-insertion rule in the syntax:

(8) *to* insertion (optional)

$[_{INFL}\ e] \longrightarrow [_{INFL}\ to]$

This seems to immediately raise some difficulty in the case of (1a), whose D-structure is as follows (without much detail):

(9) we saw $[_{\bar{S}}$ John $[_{INFL}\ e]$ leave early]

There appears to be nothing that prevents *to* from being inserted in (9). Actually it may be inserted, but in that case the semantics and, probably, the pragmatics will deal with it since unfelicitous situations should arise semantically and pragmatically. What, then, is the explanation of (1b, c)? We will discuss two possible approaches in the following sections.

## 2. A Solution on the Basis of "Case-Assignment to Clausal Arguments"

Stowell (1981) discusses the behavior of *to*-infinitives and PPs (along with tensed clauses, gerunds, and NPs) with respect to his Case-Resistance Principle (the CRP, which states that Case may not be assigned to a category bearing a Case-assigning feature) and his condition on $\theta$-role assignment (which says that $\theta$-roles can only be assigned to A-chains that are headed by a position occupied by PRO or Case; see Stowell (1981, p. 134)). According to Stowell, *to*-infinitives and PPs (and tensed clauses) are subject to the CRP since they bear a Case-assigning feature, so these categories may never appear in a position of Case-assignment at S-structure. Stowell further argues that in the case of PPs the [−N] feature in the prepositional matrix itself counts as a Case feature for the purposes of satisfying his condition on $\theta$-role assignment, adding that a $\theta$-role can only be derived compositionally within $\overline{X}$ in this case. *To*-infinitives are also assumed to be intrinsically Case-marked

like PPs, since *to,* which is actually the head of the infinitival clause and functions as a dummy Case-marker, has the [−N] feature that counts as a Case feature for the purposes of satisfying his condition on $\theta$-role assignment.

While Stowell (1981) says nothing relevant to our present discussion of perception verbs, we assume partly on the basis of Stowell's observation on the basic categorial distinctions among the [+N, −V] categories (see Stowell (1981, p. 147)) and partly on the basis of Reuland (1983) that IPV complements have the [+N, −V, −tense, +AG] (AG="agreement") features. It follows then that IPV complements are assigned Case in a position of Case-assignment at S-structure, [−N] and [+tense] being Case-assigning features.

We assume that *see* is an $\bar{S}$-deletion verb and, correspondingly, that the subcategorization frames in (7) should be replaced by the ones in (10) (see Reuland (1980, p. 11) and note 4 of this paper):

(10) a. *see*: +V, +_____$[_S \ldots [_{INFL}\ e] \ldots]$

b. *see*: +V, +_____$[_S \ldots$ *to* $\ldots]$

The S-structure of (1a) is like the following:

(11) we saw $[_S$ John $[_{INFL}\ e]$ leave early]

The clausal complement is assigned Case by *saw* in (11). But what about *John*? We assume that *John* is also assigned Case by *saw.* Both of them are cases of structural Case-assignment although in the former case the verb has a subcategorization feature requiring a clausal complement. Now there is no reason why one Case-assigner should not assign Case more than once; rather, such restrictions should be placed on $\theta$-role assignment (consider the $\theta$-Criterion in Chomsky (1981), etc.). The clausal complement in (11) is assigned a $\theta$-role by *saw,* while *John* receives a $\theta$-role as the subject of the embedded clause. Now the S-structure of (1b) is as follows:

(12) $\text{John}_i$ was seen $[_S\ t_i\ [_{INFL}\ e]$ leave early]

In (12) the S complement is not assigned Case because *seen* (a passive past participle) is not a Case-assigner; hence, (12) is ruled out by the $\theta$-Criterion under the Visibility Condition (see note 3).

Now the S-structure of (1c) is like the following:

(13) $\text{John}_i$ was seen $[_S\ t_i\ [_{INFL}$ *to*$]$ leave early]

As is argued above, *to*-infinitives are intrinsically Case-marked like PPs since

*to* has the [—N] feature that counts as a Case feature for the purposes of satisfying Stowell's condition on $\theta$-role assignment (the Visibility Condition; see note 3). Hence, the S complement in (13) is Case-marked and assigned a $\theta$-role, satisfying the $\theta$-Criterion. The trace $t_i$ is properly governed by the lexical category *seen,* thus satisfying the Empty Category Principle (the ECP). *John*$_i$ is assigned Case in the matrix subject position and the A-chain (*John*$_i$, $t_i$) can be assigned a $\theta$-role, satisfying the $\theta$-Criterion. Thus (13) is perfectly grammatical as a result of the optional *to*-insertion rule of syntax, in contrast to the ungrammatical passive structure in (12).

It can then be concluded that the function of the existence of the language-specific *to*-insertion rule in the syntax (which is our solution to the *To*-Mystery within the framework of Stowell (1981)) is to save structures such as (12), which would be ruled out by general principles. But note in this case that the semantics will so interpret the structure in (13) where *to* has been inserted as to make it compatible with the subcategorization frame in (10b) that is usually associated with the meaning of indirect perception; that is, the semantics will model the interpretation of such sentences as (1c) on that of examples such as (2a). Reuland (1982, p. 230) discusses the Dutch perception verb case in which it is impossible to passivize out of bare infinitival complements. It follows that Dutch does not have such a saving mechanism as the English *to*-insertion rule.[5]

Gee (1977, note 3) discusses the problem of whether IPV complements should be $\bar{S}$s or simply bare Ss and notes from considerations of the Specified Subject Condition and Subjacency that they should be $\bar{S}$s. But in our framework using $\bar{S}$-deletion his problem simply does not arise. Consider the following example from Gee (1977):

(14) What did you see John steal?

Its pre-$\bar{S}$-deletion structure and S-structure are as follows (*e* stands for an empty INFL):

(15) a. what$_i$ did you see [$_{\bar{S}}$ $t_i$ [$_S$ John *e* steal $t_i$]]

b. what$_i$ did you see [$_S$ John *e* steal $t_i$]

There is no problem with Subjacency, which is a condition on rule application, as can be seen in (15a). The Specified Subject Condition is simply irrelevant

since $t_i$ in (15b) is a variable.

### 3. A Solution on the Basis of Exceptional Case-Marking and the ECP

The second alternative to consider in explaining (1b, c) comes from Reuland's (1980, 1982, 1983) various works in recent years. We assume partly on the basis of the idea found in Reuland (1983) that the D-structure of (1a) is like the following:

(16) we saw [$_{\bar{S}}$ John [$_{INFL}$ −tense, +AG] leave early][6]
[N]

We also assume, based on Reuland (1980; 1983, p. 114), that AG is nominal and assigns Case by transmission (originally due to Stowell's (Stowell, T. (1980) "On the Independent Status of Case and Government," paper presented at the 1980 GLOW conference, Nijmegen) rule called *Move Case*). AG may receive Case, but is not subject to the Case Filter (which, to take an example definition from Safir (1982, p. 134), states that a lexical NP in an A-position must have Case) and its feature matrix is abbreviated as [N] (see (16)). Now Reuland (1983, p. 122) gives the following definitions of "government," "proper government," and the "governing domain":

(17) *a* governs *b* if
*b* is in the governing domain of *a* and
a. *a* has a lexical feature or is coindexed with *b*, or
b. *a* is subcategorized for *b*.

(18) *b* is properly governed by *a* iff *b* is governed by *a* under (a) and *b* is in the complement of *a*.

(19) *b* is in the governing domain of *a* iff
a. $a = X^{\circ}$ (X=N, A, V, P, COMP, INFL);
b. *a* and *b* are contained in $X^{i}$ and *a* is the head of $X^{i}$;
c. there is no *c* such that
i. $c = Y^{\circ}$ and
ii. *c* and *b* are contained in $Y^{i}$ and *c* is the head of $Y^{i}$, unless $Y^{i}$ contains *a*.

Next let us see how Reuland's (1980, p. 5) Case-assignment proceeds:

(20) a. *a* has objective Case if *a*=[N] (=NP or AG), and *a* is governed by *b* (*b*=[−N])

b. AG has nominative Case if 1) it cooccurs with [+tense]
or 2) it is ungoverned

c. *a* has Case if *a*=NP and is governed by AG

d. *a* has Case only by (20a, b, c)

*John* in (16) is governed by INFL (under the assumption that INFL is the head of S), but not by *saw*. INFL in this case has +AG ([N]), so it has lexical features. *John* cannot receive Case from *saw* since it is not governed by *saw* (see (20a)). INFL (AG) cannot have nominative Case as it does not cooccur with [+tense] (see (20b)), so it cannot assign Case to *John* (see (20c)). It follows then that there is no possible way for *John* to receive Case, as is clear from (20d). So the conclusion appears to be that lexical NPs cannot appear in the position of *John* in (16). PRO cannot appear in this position because it is governed by INFL, and traces cannot since it is not a properly governed position. Safir (1982) discusses the fourth type of empty category, which he calls EXE (the pure pronominal empty category) and can only occur outside a $\theta$-chain (see Safir (1982, pp. 84-86)). We immediately see that EXE is impossible in the position of *John* as it is a $\theta$-position. It follows then that no value could possibly be given to the NP position occupied by *John* in (16). Still, (1a) is perfectly grammatical. We noted above that AG assigns Case by transmission (originally due to Stowell's *Move Case*). Here two steps are involved with the Case-assignment of *John*. First, AG, which has the feature matrix [N], receives (objective) Case from *saw* since it is governed by *saw* ([−N]). Only then is the Case transmitted to *John* as it is governed by AG (a case of *Move Case*). AG is not subject to the Case Filter. It is only in the way described above that *John* in (16) can be assigned Case and Reuland (1983) notes that direct Case assignment is excluded under the assumption that here only the core case of government applies (see (20)), in sharp contrast to exceptional Case-marking cases.

Before seeing what we can say about (1b, c), consider the following cases (see Reuland (1983, p. 123, note 15)):

(21) a. I tried to win.

b. We believe John to be honest.

c. John is believed to be honest.

d. Mary was depended on.

Following Kayne (1981), we interpret Hornstein and Weinberg's (1981) reanalysis as involving identity of government superscripts and we assume that in such cases the verb can govern into its complement and assign Case if it is a Case assigner. Thus we interpret (21d) as follows:

(22) $\text{Mary}_i$ was depended$^k$ $[_{PP}$ on$^k$ $t_i]$

The two instances of the superscript *k* indicate that there is a reanalysis process in this case and *depended*$^k$ can govern $t_i$ as indicated by the arrow, despite the presence of *on*$^k$, which should block government by outside governors in ordinary cases. This is roughly what reanalysis means in our terms.[7] We assume with Reuland (1983) that the same process is involved with exceptional Case-marking cases; that is, exceptional Case-marking occurs when the verb assigns a superscript to the prepositional head of an adjacent constituent. We then interpret (21b, c) as follows:

(23) a. we believe$^k$ $[\bar{S}[_S$ John to$^k$ be honest]]

b. $\text{John}_i$ is believed$^k$ $[\bar{S}[_S$ $t_i$ to$^k$ be honest]]

In (23a) *believe*$^k$ governs *John* despite the presence of *to*$^k$ and assigns Case to it. (23b) shows that *believed*$^k$ can govern $t_i$, thus satisgying the ECP. The preposition is the head of a constituent adjacent to the verb both in (22) and in (23). We assume the relevant structure of (21a) to be like the following:

(24) I tried $[\bar{S}[_S$ PRO to win]]

*Try* does not have the exceptional Case-marking property that *believe* has as its lexical property. So in (24) *tried* does not govern PRO, and *to* does not govern it either (*to* (a preposition) does not have a (positively specified) lexical feature, nor is it coindexed with PRO, nor is it subcategorized for PRO (an NP to its left)). But PRO is in the governing domain of *to,* which blocks government from outside, thus creating a "vacuum" position in which PRO can appear.

We assume that (2a) can be analyzed in the same way as (21b) (see (23a)); that is, *see* is an exceptional Case-marking verb when it has the subcategorization frame in (7b) (or (10b)). The relevant structure of (2a) is as follows:

(25) we all saw$^k$ $[\bar{S}[_S$ John to$^k$ be suicidal on that occasion]]

*Saw*$^k$ can govern *John* because of the reanalysis effect as shown by the

superscripts on *saw*$^k$ and *to*$^k$. Note in this case that $\bar{S}$-deletion has not taken place and that *saw*$^k$ governs *John* across an $\bar{S}$ boundary, which should be an absolute barrier to government (see Chomsky (1981), etc.). But we assume with Reuland (1983) that something else must be going on in such cases as this. Under the assumption that COMP is the head of $\bar{S}$ and that INFL is the head of S, the most plausible candidate for (possible) governor of *John* would be *to*$^k$ in (25) according to the definition of "government" in (17), but the exceptional Case-marking property of *see* prevents *to*$^k$ from being a governor. The next most plausible candidate for governor would be COMP, but since it is null it cannot be a governor. Then it is none other than *saw*$^k$ that is the governor of *John,* the null COMP and reanalyzed *to*$^k$ having no qualification to be internal governors.

Now let us see how our framework can deal with (1b, c). We assume the S-structure of (1b) to be (26):

(26) John$_i$ was seen $[_{\bar{S}}[_S$ $t_i$ $[_{INFL}$ −tense, +AG] leave early]]

Since INFL contains AG which is nominal, it governs $t_i$, but it is not a proper governor (see (18)). *Seen* cannot govern $t_i$ because of the presence of INFL, and the structure is ruled out by the ECP.

We attribute the presence of *to* in (1c) to a marked language-specific rule of syntax and propose the following optional rule in the syntax (see (8)):

(27) *to* insertion (optional)

$$[_{INFL}\ -\text{tense, } +\text{AG}] \longrightarrow [_{INFL}\ to]$$

This is our answer to the *To*-Mystery along the lines of Reuland's approach. Note that the answer comes in exactly the same form as in the case of Stowell's solution. This is not surprising in view of the fact that both of these approaches are based primarily on the general GB (Government-Binding) framework of Chomsky (1981) (each with different assumptions). That is, (27) is basically equivalent to the rule in (8), although we are discussing the problem within a somewhat different framework. Then we take the relevant structure of (1c) to be as follows:

(28) John$_i$ was seen$^k$ $[_{\bar{S}}[_S$ $t_i$ $[_{INFL}$ to$^k$] leaves early]]

The governmental situation in (28) is exactly the same as that in (23b) and (25). This means that the reanalysis process models the treatment of (1c) on

that of examples such as (2a). As noted above in our discussion of Stowell's approach, the semantics will also model the interpretation of (1c) on that of (2a).

Thus, although there may be a direct perception/indirect perception semantic difference between (1a) and (1c), the language-specific *to*-insertion rule of syntax in (27) functions as a structure-saving mechanism, in sharp contrast to the Dutch case noted above (see Reuland (1982)).

## 4. Considerations from an Acquisitional Point of View

We have presented above two possible explanations (based on Stowell (1981) and Reuland (1983, etc.)) of the kind of phenomenon with perception verbs as exemplified in (1). In both cases we have solved the problem of the *To*-Mystery by introducing a marked *to*-insertion rule of syntax (see (8) and (27)). We are now going to examine the problem once again from an acquisitional point of view and see whether the existence of such a rule as *to*-insertion as a saving device is really tenable.

First let us see the Stowell solution. Consider the following cases:

(29) a. I saw Mary cross the river.

b. I saw Mary to be unkind.

Since *see* is an $\bar{S}$-deletion verb in both cases in (29), (29a, b) are marked constructions (see Lasnik (1981), for example) and the child learning the language does not expect such constructions to be possible in his/her language until he/she hears such sentences uttered in his/her speech community. (Of course, the child must hear such sentences as (29a) and (29b) (or its passive counterpart) in order to know what some of the subcategorization frames of *see* are really like; that is, in order to know the complement types of *see* in the relevant cases.) Then consider the following passive cases:

(30) a. *Mary was seen cross the river.

b. Mary was seen to cross the river.

c. Mary was seen to be unkind.

The child predicts (30a, c) after he/she has acquired (29a, b) (that is, the verb's complement types, markedness, etc.). But since the language-specific *to*-insertion rule is involved in the derivation of (30b), the child does not expect (30b) to be possible until he/she obtains positive evidence. It is only

after he/she hears sentences such as (30b) uttered that he/she knows and acquires the marked *to*-insertion rule, and then he/she goes on to model the interpretation of (30b) on that of (30c).

Then let us consider the acquisitional situation in which the child hears (30b, c) before (29). (Note that the child needs positive evidence since both of (30b, c) are marked and also that children are not presented with the same data in the same order (White (1981, p. 253)).) The child predicts (29b), but he/she does not know the (possible) existence of (29a) until he/she receives positive evidence. That is, he/she still does not know the existence of *to*-insertion rule at the stage when he/she has acquired (30b, c). This situation arises because both of (30b, c) denote indirect (mental) perception and the child cannot make a relevant distinction between the two cases. (It would be quite implausible to claim that the lexical distinctions between *cross the river* and *be unkind* were relevant in this case.) White (1981) claims that the child's grammar at every stage of acquisition is optimal (*by definition*) and not only at the final stage, taking the notion "optimality" to be relational (thus, grammar A is optimal with respect to data A and grammar B is optimal with respect to data B). Then the above situation that the child is not sure about *to*-insertion rule at the stage where he/she has acquired (30b, c) (one of the many stages of acquisition) poses a serious problem for the Stowell approach, under the assumption that White's (1981) claim about optimality is basically correct.

Then we will consider the Reuland solution. (29a) represents a core case of government (see Reuland (1983)) and is an unmarked construction, so the child should predict (29a) without positive evidence. But since positive evidence is (trivially) necessary to know the complement types of verbs, the real situation is that the child hears sentences such as (29a) before he/she knows the existence of such a complement type as represented by (29a). As for (29b), positive evidence is necessary as it is a case of reanalysis (see 25)). The child predicts (30a, c) after he/she has acquired (29a, b), but he/she needs positive evidence in the case of (30b) because of the marked *to*-insertion rule ((27)). After acquiring *to*-insertion he/she interprets (30b) on the basis of (30c).

On the other hand, in case the child has access to (30b, c) before (29),

he/she predicts (29b), but not (29a). This acquisitional situation is basically the same as in the case of the Stowell solution. The child is not sure about *to*-insertion at the stage where he/she has acquired (30b, c). Here again the same kind of serious problem arises in regard to White's (1981) "optimality" claim noted above.

Now it seems that there is not much significant difference (but note that the Stowell approach takes (29a) to be marked, while the Reuland solution claims that it is unmarked) between the two approaches discussed above, both of them having the same problem with repect to *to*-insertion. So far we have presented our two solutions with the marked insertion rule of syntax as crucial part of explanation. But it appears that it is the very existence of this rule that causes the above problem with acquisition to arise. So we assume that *to*-insertion (see (8) and (27)) does not exist in English.

Then let us reconsider (29) and (30) under the assumption that *to*-insertion does not exist and see what we have to say about the *To*-Mystery under this assumption. Now we can immediately see (whether we adopt the Stowell approach or the Reuland) that positive evidence is needed to acquire (29a, b) and that the child can predict all of (30a, b, c) once he/she knows (29a, b). This follows from our assumption that the D-structure of (30b) is as follows (without much detail):

(31) *e* was seen $[_{\bar{S}}[_{S}$ Mary to cross the river]]

(31) ((30b)) is predicted from (29b) (that is, (29b) and (30b) have the same subcategorization frame in (7b)). This means that (30b) uses the same complement type as (29b) and (30c) from the beginning. There is no reason not to use the same complement type since there is no relevant semantic difference between (29b), (30c), and (30b). Rather, it seems that there is no exact passive counterpart of (29a) (with the meaning of direct perception) and that (30b), which expresses a meaning close to the meaning that would be borne by hypothetical (ungrammatical) (30a) although there is a direct perception/indirect perception difference, narrowly functions as the passive counterpart of (29a). Then what happens in case the child is given (30b, c) before (29)? The child will give the same interpretation (in relevants) to (30b, c) and predict only the (possible) existence of (29b). But the child's grammar at this stage does not contain *to*-insertion (that is, an acquisitional situation does not

arise where the child is not sure about the existence of a rule), and his/her grammar is "optimal" since it can properly deal with (29b) and (30b, c). As for (29a), the child's grammar at this stage simply does not deal with it. And when the child has a chance to have access to sentences such as (29a) at a later stage, he/she then goes on to construct another optimal grammar dealing with (29a) and the previous data as well.

We see no distinguishable difference in adequacy between the Stowell solution and the Reuland, but conclude that it is more plausible to do away with *to*-insertion from an acquisitional point of view. It follows then that the "true" saving device is not such a language-specific rule as *to*-insertion, but the existence of the subcategorization frame in (7b) as exemplified in (29b).

White (1981), however, claims (mainly on the basis of Chomsky's (1975) notion of "instantaneous extensional learning") that the only relationship between a child's grammar and an adult's is that each is a possible grammar as defined by linguistic theory and that there is nothing to ensure that a child's grammar at some stage of acquisition does not change till it reaches the final stage. If this is correct, there is no reason that the child's grammar (without *to*-insertion) constructed at the stage where the child has acquired (30b, c) should be carried over to the final stage. Moreover, since it seems plausible that we should have a kind of cognitive active/passive dichotomy, we tend to connect (29a) and (30b) cognitively. Then the D-structure of (30b) might be (32), but not (31) (as for INFL, only its structure in the case of the Stowell approach is shown):

(32) *e* was seen [$_{\bar{S}}$[$_{S}$ Mary [$_{INFL}$ *e*] cross the river]]

That is, (29a) and (30b) would start from the same subcategorization frame (with the meaning of direct perception). This way of looking at things would entail the existence of *to*-insertion. It would follow then that an adult's grammar needed such a marked language-specific rule of syntax as *to*-insertion (which would be a possible grammar sanctioned by linguistic theory incorporating markedness theory). But there is no reason that our congnitive active/passive dichotomy (under the assumption that such a dichotomy exists) should be syntactically represented, particularly in the form of identity of subcategorization frames at D-structure. Rather, it should be the semantics that has to deal with such a cognitive dichotomy. That is, the very situation in

which the (29a)/(30b) pair is felt to be an active/passive pair despite the direct perception/indirect perception difference seems to indicate that this cognitive dichotomy may interact with the output of sentence grammar to ultimately produce the complete semantic representation. Hence, we still take the D-structure of (30b) to be (31).

And we conclude that *to*-insertion does not exist, not because the child's grammar at the stage where (30b, c) have been acquired does not contain *to*-insertion (but it is possible that some property of the child's grammar at some stage of acquisition is carried over to the final stage and we assume the above case to be an instance of this; see also the discussion in Otsu (1982)), but because the cognitive active/passive dichotomy is semantic in nature and so it does not have to be syntactically represented, the latter option entailing the high cost of imposing the acquisition of a marked rule on the child learning the language. So our final answer to the *To*-Mystery is the existence of the subcategorization frame in (7b).[8]

**Notes**

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1. Harakawa (1983) notes that in case such a sentence as (1c) contains a *by*-phrase, it denotes direct perception on the part of the object of *by*. He also reports Bolinger's observation that sentences of the (1b) type are not well-established. We will present our argument in this paper on the basis of the grammaticality judgment found in (1b, c) and leave out of consideration cases in which sentences of the (1c) type contain a *by*-phrase.
2. Kayne (1981a, p. 335) also gives some evidence in support of the structure '... V $\overline{S}$ ...' (as opposed to '... V NP $\overline{S}$ ...'). As for sentences such as (1a), Kayne postulates an abstract morpheme INF (which occurs in the INFL position) and Case is assigned by INF from within the embedded $\overline{S}$ to the embedded subject. The ungrammaticality of (1b) is explained by his Subject Island Condition (SIC) (which states that a subject anaphor that has a Case assigned from within $\overline{S}$ cannot be free in $\overline{S}$).

3. Stowell (1982) gives the following definitions of three of the major principles of the GB (Government-Binding) theory (based on Chomsky (1981)):

(i) The $\theta$-Criterion

(a) Each thematic role ($\theta$-role) must be assigned to one and only one argument-chain (A-chain).

(b) Each A-chain must be assigned one and only one $\theta$-role.

(ii) The Visibility Condition

A $\theta$-role $R$ may be assigned to an A-position $A$ if and only if $A$ appears in an A-chain that is headed by an A-position which has Case or is occupied by PRO.

(iii) Case-Assignment under Government

In the configuration $[\ldots\beta\ldots\alpha\ldots\beta\ldots]$, $\alpha$ assigns Case to $\beta$, if and only if (a) $\alpha$ governs $\beta$, and (b) $\beta$ is adjacent to $\alpha$, and (c) $\alpha$ is either [−N] or [+Tense].

4. Reuland (1983) assumes that in general government and strict subcategorization go together, except for government by INFL and cases of so-called exceptional government and Case-marking. That is, government theory captures the relation between the head of a construction and categories dependent on it. And the relation of government holds between a lexical category (e.g., V) and the head of its dependent. Let us see some examples (see Reuland (1983, p. 104)):

(i) a. $[_{S}$ NP* INFL $[_{VP}$ V NP]]

b. $[_{S*}$ NP* INFL* $[_{VP}$ V* $[_{\bar{S}}$ COMP $[_{S}$ NP° INFL $[_{VP}$ V NP]]]]]

In (ia) V governs and subcategorizes for a constituent the head of which is N (namely, NP), and in (ib) V* governs and subcategorizes for a constituent the head of which is COMP (that is, $\bar{S}$). Subcategorizing for a clausal complement means "subcategorizing for a constituent the head of which is COMP." The relevant strict subcategorization feature in this case is "take a projection of COMP," and COMP itself is mentioned in the subcategorization frame since it is also governed by the lexical head. Reuland assumes that in case COMP is empty, the relevant strict subcategorization feature of the lexical head cannot be "take a projection of COMP," but must be "take a projection of INFL" under the assumption

that INFL is the head of S, in which case INFL is governed by the lexical head (see (17), (19)). If Reuland's argument above is correct, the subcategorization frames in (7) should be replaced by (ii):

(ii) a. *see* : +V, +_____$[_S \cdots [_{INFL}\ e] \ldots]$

b. *see* : +V, +_____$[_S \ldots\ to \ldots]$

But we do not see much point in opting for (ii), given the definition of government in section 3 (see (17), (19)) and Reuland's decision not to use $\bar{S}$-deletion in dealing with exceptional Case-marking cases (see Reuland (1983, p. 123)). It does not make any significant difference in Reuland's framework whether we adopt (7) or (ii). Rather, following Reuland (1983, note 9), we propose that (7) and (ii) be replaced by (iii):

(iii) a. *see* : +V, +_____$[_{INFL}\ e]$

b. *see* : +V, +_____$[_{INFL}\ to]$

In the text we will continue our discussion along the lines of (7) or (ii).

5. Takashi Niwa (personal communication) points out that the French counterparts of strings such as (1b) seem possible:

(i) ?Jean a été vu traverser le fleuve.

John was seen (to) cross the river

The example in (i) is taken from Kayne (1981c, p. 354), where it is noted that the passive corresponding to *On a vu Jean traverser le fleuve* 'We saw John cross the river' (i.e., (i)) is marginal. We take the S-structures of the active case and (i) to be as follows:

(ii) a. on a $vu^k$ $[_{\bar{S}}[_S$ Jean $[_{INFL}$ −tense, −AG$]^k$ traverser le fleuve]]

b. $Jean_i$ a été $vu^k$ $[_{\bar{S}}\ _S\ t_i\ [_{INFL}$ −tense, −AG$]^k$ traverser le fleuve]]

French *voir* is an exceptional Case-marking verb, while English *see* (in the relevant sense and within Reuland's framework) and Dutch *zien* are not. (See the discussion of the Reuland approach in the text. Reuland (1983) takes reanalysis and exceptional Case-marking to be instances of the same process, where the verb assigns a superscript to the prepositional head of an adjacent constituent. We assume that INFL in (ii) ([−tense, −AG]) is nondistinct from [−N, −V] with respect to relevant features.)

Thus, in (iia) *vu*$^{k}$ governs *Jean* and assigns Case to it and in (iib) *vu*$^{k}$ properly governs $t_i$, satisfying the ECP (as indicated by the arrows). There is a further difference noted in the text; namely, English has a saving mechanism such as *to*-insertion but Dutch does not (but see the final solution to the *To*-Mystery). Since French *voir* is an exceptional Case-marking verb, sentences such as (i) are saved without a rule like *to*- insertion.

6. Reuland (1983, p. 130) presents the possible expansions of INFL on the basis of two separate parameters ([±tense] and [±AG]). He employs the [−tense, +AG] type to deal with the following cases:

(i) a. Roddy tried to avoid Elaine, he being a confirmed bachelor.
(a nom-*ing* case)

b. We understand John departing tomorrow.
(a acc-*ing* case)

Reuland notes that acc-*ing* constructions basically fit the same position in the paradigm as nom-*ing* ones, but share some properties with the [−tense, −AG] case. We add INFL associated with IPVs to the set of the [−tense, +AG] type. One noticeable difference between (ia) on the one hand and (ib) and IPVs on the other is that in the former case INFL is ungoverned, while in the latter it is in a governed position. And a minor difference between (ib) and IPVs which we can see is that INFL is phonetically realized as *-ing* in the former case while it is not in the latter.

7. Consider the following classic example:

(i) who$_i$ do you think [$_{\bar{S}}$ $t_i'$ [$_S$ $t_i$ INFL$_i$ VP]]

INFL$_i$ is [+tense, +AG] in (i). The traces $t_i'$ and $t_i$ are coindexed as a result of Move $\alpha$ and $t_i$ and INFL$_i$ are coindexed since the former has Case from the latter. Then $t_i'$, $t_i$, and INFL$_i$ are all coindexed. Reuland (1983, p. 124) interprets this situation basically in the same way as reanalysis cases for the purposes of satisfying the ECP; namely, $t_i'$ can (properly) govern $t_i$ despite the presence of INFL$_i$, under the assumption that COMP is the head of $\bar{S}$ and that the indexing applies to COMP as a whole. Then consider the following:

(ii) Who did you see run?

We assume the relevant structure of (ii) to be (iii):

(iii) who$_i$ did you see [$_{\bar{S}}$ $t_i'$ [$_S$ $t_i$ INFL$_i$ run]]

INFL$_i$ in (iii) is [−tense, +AG]. As noted above, two steps are involved with the Case-assignment of $t_i$. First, AG receives Case from *see,* and then the Case is transmitted to $t_i$. (We assume that Case transmission entails coindexing and, more generally, that Case transmission from a (possible) Case-asignee to another Case-assignee entails coindexing, INFL (with [+tense, +AG]) being among (possible) Case-assignees (see (i)).) Alternatively (if we adhere in this case to Case-assignment (or Case-checking) at S-structure (Chomsky (1981), etc.)), we assume that *see* assigns Case to $t_i'$ since the latter is governed by the former and that the relevant chain formation mechanism will complete the task (see Kayne (1983, p. 108) for an example of "Case-marking into COMP"). For the purposes of satisfying the ECP, we adopt Reuland's (1983) interpretation of sentences such as (i) above, and then we immediately see that the same situation obtains in (iii) as in (i) since in (iii) $t_i'$ can (properly) govern $t_i$, thus satisfying the ECP. But in case INFL is not coindexed with $t_i$ (the "Case-marking into COMP" case), the ECP is violated as INFL (improperly) governs $t_i$. Since it is quite beyond the scope of this paper to discuss where and how Case is assigned or checked in the grammar, we simply adopt Franks' (1981) suggestion that "Assign Case" may apply anywhere it can in the syntax (partly due to David Pesetsky's indication).

Note that Suzuki (to appear) suggests a third way of handling the case in (ii) (adhering to Case-assignment at S-structure). Suzuki adopts Safir's (1982) definition of the Case Filter to the effect that "a lexical NP in an A-position must have Case" and Reuland's (1980) version of Case-assignment (in the core cases; see (20)), and he also proposes a lexical parameter called COMP/INFL Collapsing (which cosuperscripts COMP and INFL in a clausal complement, thus changing the existing governmental situation in the complement and hence allowing COMP to govern into the governing domain of INFL), presenting an informal means of measuring the degree of markedness of a given verb in numerical terms on the basis of three lexical parameters: exceptional Case-marking, COMP/INFL Collapsing, and "rule merger." Let us consider the following within Suzuki's (to appear) framework:

(iv) a. we saw $[_{\bar{S}}[_{S}$ John $[_{INFL}$ −tense, +AG] run]]

(We saw John run.)

b. $we_i$ saw $[_{\bar{S}}[_{S}$ $PRO_i$ $[_{INFL}$ −tense, +AG] run]]

(*We saw run.)

c. $John_i$ was seen $[_{\bar{S}}$ $COMP^k$ $[_{S}$ $t_i$ $[_{INFL}$ −tense, +AG]$^k$ run]]

(*John was seen run.)

d. $who_i$ did you see $[_{\bar{S}}t_i'^k$ $[_{S}$ $t_i$ $[_{INFL}$ −tense, +AG]$^k$ run]]

(Who did you see run?) (=(ii))

We assume that *see* (in the sense of direct perception) is an optional COMP/INFL Collapsing verb, but not an exceptional Case-marking one. (It cannot be an exceptional Case-marking verb since the relevant reanalysis process involves the cosuperscripting between the verb and the prepositional head of an adjacent constituent, perhaps the feature [−N] and the "same style of government" condition in the sense of Kayne (1981c) being relevant to reanalysis. Of course, *see* is not a "rule merger" verb either.) In (iva) there is no application of COMP/INFL Collapsing. If it should apply, *John* would be governed by (null) COMP (which does not assign Case because it is null and nominal; see Suzuki (to appear, notes 7, 8)) and the structure would ruled out by the Case Filter. (See section 3 of the text for the Case-assignment of *John.*) In (ivb) $PRO_i$ is governed whether or not COMP/INFL Collapsing applies (in case COMP /INFL Collapsing applies, COMP governs $PRO_i$ since it has nominal features by virture of the existence of INFL with AG; a violation of the the Binding Theory; sentences such as (ivb) have been brought to my attention by Kaneaki Arimura). In (ivc) $t_i$ is improperly governed by INFL in case there is no application of COMP/INFL Collapsing. Suppose that COMP/INFL Collapsing applies as shown in (ivc). We assume that (nominal) $COMP^k$ governs $t_i$, but that it does not properly govern $t_i$ since $t_i$ is not in the complement of $COMP^k$ (while $COMP^k$ has nominal features by virtue of the existence of INFL with AG, it has no strict subcategorization features; see Suzuki (to appear, note 9)). Suzuki (to appear) claims that the lower [−N] category that is governed by the higher [−N] category can transmit (proper) government from the higher [−N]

category to another category (see the treatment of *say* in Suzuki (to appear)). But in the case of (ivc), $COMP^k$ (nominal) cannot transmit (proper) government from *seen* ([+V], and nondistinct from [−N]) to $t_i$ since $COMP^k$ is not a [−N] category (perhaps due to some kind of lexical feature consistency condition on government transmission). Accordingly (ivc) is ruled out by the ECP. Now let us examine (ivd). If COMP/INFL Collapsing did not apply, the structure would be ruled out by the ECP since $t_i$ would be improperly governed by INFL. In (ivd), *see* governs $t_i'^k$ and assigns Case to it, and then $t_i'^k$ transmits the Case to $t_i$ (see the treatment of *want* in Suzuki (to appear)). The empty category $t_i$ is properly governed by $t_i'^k$ thanks to COMP/INFL Collapsing, thus satisfying the ECP.

Then let us compare *see* with the meaning of direct perception with *see* in the sense of indirect perception. Consider the following cases:

(v) a. we saw$^k$ [$_{\bar{S}}$[$_S$ John to$^k$ be honest]]

(We saw John to be honest.)

b. we$_i$ saw$^k$ [$_{\bar{S}}$ (COMP$^k$) [$_S$ PRO$_i$ to$^k$ be honest]]

(*We saw to be honest.)

c. John$_i$ was seen$^k$ [$_{\bar{S}}$[$_S$ t$_i$ to$^k$ be honest]]

(John was seen to be honest.)

d. who$_i$ did you see$^k$ [$_{\bar{S}}$ t$_i'^k$ [$_S$ t$_i$ to$^k$ be honest]]

(Who did you see to be honest?)

We assume that *see* (in the sense of indirect perception) is an obligatory exceptional Case-marking verb and an optional COMP/INFL Collapsing one. In (va) *saw*$^k$ governs *John* and assigns Case to it. There are two possibilities in (vb); namely, a case in which both exceptional Case-marking and COMP/INFL Collapsing have applied and a case in which we only have application of exceptional Case-marking. PRO$_i$ is governed in both cases, thus violating the Binding Theory. In (vc) $t_i$ is properly governed by *seen*$^k$ and the passive sentence meets the "natural predicate criterion" of Hornstein and Weinberg (1981) since *seen* is a natural predicate. Note that in case COMP/INFL Collapsing also applied in (vc) it would be *seen COMP* that was the natural predicate in question. But

*seen COMP* is not a possible natural predicate. In (vd) $t_i'^{k}$ transmits Case from $see^{k}$ to $t_i$ and $see^{k}$ properly governs $t_i$.

Now let us see how marked these two instances of *see* are on the basis of the three lexical parameters mentioned above:

(vi)

| parameters / verbs (markedness) | exceptional Case-marking | COMP/INFL Collapsing | "rule merger" |
|---|---|---|---|
| *see* (2) (direct perception) | no | optional | no |
| *see* (3) (indirect perception) | obligatory | optional | no |

Thus we see that *see* (direct perception) is 2 and *see* (indirect perception) is 3 from the viewpoint of their degree of markedness. And *see* (indirect perception) can be said to be more marked than *see* (direct perception) (actually *see* (indirect perception) occupies exactly the same position on the scales of markedness as *believe*; see Suzuki (to appear)).

8. Note that this final solution is not incompatible with Stowell's framework or with Reuland's. Rather, it was the existence of *to*-insertion that presented the acquisitional problem mentioned in the text. And there is nothing inherent in Stowell's framework or in Reuland's that forces us to include *to*-insertion as a device of description. But Reuland seems to be assuming something like our *to*-insertion to explain the *To*-Mystery (see Reuland, E. J. (1982) "On the Governing Properties of Infinitival Markers," in T. Fretheim and L. Hellan, eds., *Papers from the Sixth Scandinavian Conference of Linguistics,* Tapir Publishers, p. 133).

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