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On the Licensing of Perception Verb Complements

Umehara Daisuke

1. The aim of this paper is to investigate what kinds of licensing principles suffice to give an account of possible complementations to perception verbs in English. We will argue that we need three licensing devices to describe the distribution and temporal interpretation of perception verb complements (henceforth PVCs), namely i) satisfaction of Time arguments, ii) I–V coindexing and iii) binding conditions for infinitival INFLs.

2. Constraints on bare infinitives

2.1 Distributional constraints

Perception verbs (*see*, *hear* etc.) can take both participles and bare infinitives in their complements; (1). As is often observed, however, only the construction of the former type allows passivization; (2).

- (1) a. John saw Bill cross the bridge.
- b. John saw Bill crossing the bridge.¹⁾

- (2) a. *Bill was seen cross the bridge.
- b. Bill was seen crossing the bridge.

In fact, the distribution of bare infinitives is much more restricted than that of participles.

- (3) a. *What we saw was Mary take a bath.
- b. What we saw was Mary taking a bath.
- (4) a. *It was Mary take a bath that we saw.
- b. It was Mary taking a bath that we saw.

- (5) a. *?We could hear, but we couldn't see, Mary take a bath.
 b. We could hear, but we couldn't see, Mary taking a bath.
- (6) a. *Mary take a bath, you will see at once.
 b. Mary taking a bath, you will see at once.

All these examples show that the NP + bare-infinitive sequence is not likely to occur if detached from the main verb. There are three possibilities to rule out the a. sentences. First, if NP and bare VP do not form a constituent, one cannot move this string. Second, the Case-Filter may rule out these sentences, since there seem to be no Case-assigners adjacent to the 'small clause' subjects. Third, a constraint on bare VP may help, which is yet to be specified but has been suggested by some linguists.²⁾ Note that b. sentences in (3) – (6) are all well-formed. If we are to pursue the first two possibilities, we are forced to claim that the two types of PVCs are structurally distinct. We will claim in what follows that the two types of PVCs are structurally identical and that we must take the third option to account for the asymmetry in (3)–(6). I give three pieces of evidence. First, the two types of PVCs can be conjoined, which shows that both the external category and the category of the predicates are of the same type.

- (7) a. Tom heard a door open and someone approaching.
 b. I heard someone coming and open the door.

(Declerck 1982:3)

Second, both of the two types of complements work as antecedents of either a pronoun *it* or a relative pronoun.

- (8) a. I saw John dancing/dance, and Bill saw it too.
 b. I saw John dancing/dance, which was a great surprise.

The third evidence comes from the scope interaction of quantifiers. In (9), the matrix subject QPs unambiguously take wider scopes.

- (9) a. Someone saw everyone dance.
 b. Everyone heard someone sing a song.

These facts show that the complements consist of one constituent containing NP and VP, to which the quantified NP is adjoined at LF by QR, to form (10).

- (10) [someone_i [t_i Infl [see [everyone_j [t_j dance]]]]]

If the complement consisted of two separated constituents, the 'object' QPs would be raised either to the matrix IP (according to May 1985) or to the matrix VP (according to Aoun and Li 1989). In either case scopal ambiguities are incorrectly predicted.

We will go on to argue that the Case-Filter cannot provide a solution to (3)–(6). There is independent evidence that NPs which are not governed by Case-markers at S-structure will not violate the Case-Filter if they are Case-marked at D-structure. Compare (11) with (12).

- (11) a. More jobs in linguistics is what I want.
 b. Susan/Her/*She in New York is what I don't want.

- (12) Mary taking/*take a bath was what we saw.

(11a) shows a singular agreement between the verb and the subject, which means that the subject is not an NP headed by the plural noun *more jobs*. The subject of this 'small clause' is apparently not governed by any Case-marker. In addition to this, (11b) shows that the 'small clause' subject bears an Accusative not a Nominative Case. The origin of this Acc is uncertain, but we may well think that this position is somehow related to the object position of *want*. Compared with (11), it is natural to expect that *Mary* in (12) is also properly Case-marked. The ungrammatical construction with infinitive in (12) and all the ungrammatical b. sentences in (3)–(6), therefore, are not due to the Case-Filter violation.

Summerizing this section, we conclude that ungrammaticality of b. sentences in (3)–(6) should be attributed to a licensing condition of bare infinitives.

2.2 Satisfaction of Time argument

There is an independent motivation that a constraint on bare infinitives in general is needed. For example, take ungrammatical sentences (13).

- (13) a. *It is fun [play tennis].
 b. *[Play tennis] is fun.
 c. *John has no friend [talk with].
 d. *John came home [sing a song].

If the bare verbs are converted into participles or *to* is put before them, grammaticality will be restored. (13) together with (3b)–(6b) suggest that bare infinitives are not licensed unless governed by tensed INFL. We assume that all verbs, whether statives or eventives, main verbs or aspectual auxiliaries, have a Time argument and it must be satisfied in the following way to get a temporal interpretation at LF.

- (14) A time argument of a verb must be satisfied.

(15) Satisfaction of Time argument (tentative)

Time argument of a bare verb is satisfied

- i) when the verb is governed by [+Tense] INFL.^{3), 4)}

In [+Tense] INFL I include finite INFLs, which are specified with the feature [+/- PAST], and also infinitival INFL *to* (for details see section 4).

(15) can properly rule out the examples (14). However, note that we have not yet specified how bare VPs in PVCs get their Time arguments satisfied. Evidently they have no tensed INFL which is close enough

to serve as a licenser. We are tempted to claim that perception verbs 'exceptionally' license Time arguments of PVC predicates, but we dare not say so at this moment, since there is another distributional constraint which (15) alone cannot account for.

3. Aspectual constraints

3.1 Statives

We can observe that stative verbs do not occur in PVCs.

- (16) a. I saw John/*the lamp stand on the table.
 b. *I saw Mary knowing the answer.
 c. I saw John being honest.

In (16a) when the embedded subject is an animate NP, the verb *stand* is interpreted as non-stative, whereas when the embedded subject is an inanimate NP like *the lamp*, a stative reading is forced and an ungrammatical sentence results. (16b) shows that a stative VP may not appear even when it is used in a participial form. On the other hand the VP *be honest* can be interpreted as non-stative and is allowed as in (16c). This contrast parallels (17).

- (17) a. *John is knowing the answer.
 b. John is being honest.

What is observed in (16) cannot be accounted for by the device given in the previous section. We must here employ another device to distinguish stative verbs from other kinds of verbs.

Vendler 1967, which is a now classical work, presented a fourfold classification of verbs with regard to temporal properties.

(18) Vendler's classification of verbs

- a. Statives (know, resemble, be tall, etc.)
 b. Accomplishments (paint a picture, run a mile, etc.)

- c. Activities (run, smile, cry, etc.)
- d. Achievements (notice, lose, receive, etc.)

Trying to put this classification into the framework of GB theory, Roberts 1986 proposes the following indexing convention.

- (19) a. I_i V_i NP : activities, achievements
- b. I_i V_i NP_i : accomplishments
- c. I V_i NP_i : middles
- d. I V NP : statives

(Roberts 1986:24)

This coindexing relation represents temporal dependency between INFL and Verb. In other words, non-stative verbs must be bound by a certain time at which the event occurs, while stative verbs have no such temporal dependencies. That this coindexing relation is crucial in licensing PVCs is shown in (20).

- (20) a. John saw Mary paint a picture. (accomplishment)
- b. John saw Mary cry. (activity)
- c. John saw Mary receive the gift. (achievement)
- d. *John saw the book sell/selling well. (middle)
- e. *John saw Mary know/knowing the answer. (stative)

I must mention that in this paper we have no need to distinguish all the four types of verbs. What is of special importance here is the relation between INFL and V. Therefore we will just distinguish 'statives', with which I-V coindexing does not occur and 'non-statives', with which I-V coindexing does occur.

Roberts states that perception verbs "require that the complement predicate be dependent on the higher Tense. (ibid. p. 201)" (20de) are ungrammatical because the complement predicates are not dependent on the higher Tense. This requirement, however, seems to be rather ad

hoc. We will try to give more principled account. At this point we can formalize the coindexing relation between INFL and Verb in a following fashion.

(21) The Convention of I–V Coindexing

Freely coindex INFL[+Tense] and V.

(22) Temporal interpretation

- a. I^i V^i non-stative
- b. I V stative

The interpretation of stative and non-stative verb phrase is represented in (23ab) respectively, where subscripts show satisfaction of Time arguments and superscripts show I–V coindexing.

- (23) a. John INFL_i know_i the answer.
- b. John INFL_i^j hit_i^j Mary.

In order to license PVCs, we propose (24).

(24) Coindex a perception verb and its complement predicate.

(24) is a marked option for perception verbs (and presumably causative verbs). Note that this is an optional requirement and not an obligatory one as Roberts stated. Adding just (24) we can give a fair account of constraints on statives. See (25).

- (25) a. John saw Bill cross the bridge.
- b. *John saw the lamp stand on the table.

The D-structure of (25) is given in (26).

- (26) [John INFL_j [see_jⁱ [IP NP INFL₀ [VP Vⁱ ...]]]]

The Time argument of the main verb *see* is satisfied by the matrix INFL. However, the complement predicate cannot have its Time argument satisfied within the small clause since its INFL is not tensed. Here (24)

is employed and the complement predicate is coindexed to the main verb *see*. Through this coindexing the bare infinitive gets its Time argument satisfied. Note that this coindexing represents the temporal dependency between the perception verb and the complement predicate. In the case of (25a), the time of John's seeing synchronizes with the time of Bill's crossing the bridge. Hence we get a non-stative reading. The same account goes for (25b); unless the main verb and the complement predicate are coindexed through (24), the Time argument of the complement predicate is not satisfied. If the two verbs are coindexed, non-stative reading of the complement predicate is forced. The sentence therefore will be ungrammatical unless we take *the lamp* as an animate being through, say, personification.

In order to license (25a) we revise the requirement (15) into (27).

(27) Satisfaction of Time argument (revised)

Time argument of a bare verb is satisfied.

- i) when the verb is governed by [+Tense] INFL, or
- ii) when the antecedent coindexed with it is governed by [+Tense] INFL.

3.2 Aspectuals

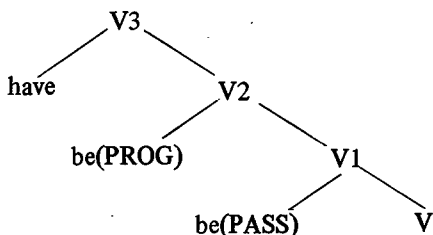
It is well known that progressives and perfectives do not occur in PVCs.

- (28) Mary saw the princess $\left\{ \begin{array}{l} \text{a. kiss/kissing} \\ \text{b. *have/*having kissed} \\ \text{c. *be/*being kissing} \\ \text{d. ?be/being kissed by} \end{array} \right\}$ the frog.

(Lapointe 1980:772)

Akmajian, Steele and Wasow 1979 (ASW) gives the following structure of VP.

(29)



If, as ASW argues, perception verbs select V1 instead of any other projection level as their complements, we can automatically account for the data given in (28). The structure (29), however, has a couple of theory internal disadvantages. In the first place, from the viewpoint of X-bar theory it is not reasonable to allow the third level projection only to verbal system. In the second place, since aspectual auxiliaries may undergo Head-to-Head movement, to give them a status of non-head will cause violation of structure preservation.

In what follows, we will claim that perfective *have* and progressive *be* are both classified as stative verbs. If this is correct, constraints on statives we have just seen above will also work to constrain aspectuals, and we can do without the structure (29).

3.2.1 Perfectives, progressives and stativity

The following observations show that perfective *have* and progressive *be* are both kinds of stative verbs.

First, perfective *have* is not used in a progressive construction.

- (30) a. *Mary is having left the room.
 b. Mary is leaving the room.
 c. *Mary is knowing the answer.

Second, stative verbs may not appear in the focus of pseudocleft construction.

- (31) a. *What John did was have left the room.
 b. *What John did was be running.
 c. *What John did was know the answer.
 d. What John did was leave the room.

Third, modification by *deliberately* lowers grammaticality.

- (32) a. ?John deliberately has left the room.
 b. *John deliberately was leaving the room.
 c. John has deliberately left the room.
 d. John was deliberately leaving the room.

(32cd) are grammatical because what *deliberately* modifies are not aspectual auxiliaries but participles, which are non-stative verbs.

3.2.2 Temporal interpretation of aspectuals

Distributional and interpretative differences between infinitival PVCs and participial PVCs are stated in terms of the two properties which we have discussed; i.e, 1) satisfaction of Time argument and 2) temporal dependency through coindexing.

- (33) Temporal properties of progressive V-ing
 a. Time argument is satisfied between V and -ing.
 b. There is a temporal dependency between V and -ing.
- (34) Temporal properties of perfective V-ed⁵⁾
 a. Time argument is satisfied by *have*.
 b. (21) may hold between *have* and V-ed.

4. To-infinitives

Contrast again the following two sentences.

- (35) a. John saw Bill cross the bridge.
 b. Bill was seen *(to) cross the bridge.

- (36) a. John saw Bill crossing the bridge.
 b. Bill was seen crossing the bridge.

We can account for (36) using (33). Since the VP *crossing the bridge* is temporally independent of the main verb, the time of John's seeing does not synchronize with the time of Bill's crossing the bridge. (Compare this reading with that of (25a)).

In order to account for (35), we need the third device; namely the binding conditions for infinitives. Stowell 1982 regards infinitives as tensed clauses. According to him, infinitival INFL has a feature [+Tense] as finite tense does, but unlike finite tense, value of the feature [PAST] is unspecified. This idea was first employed to defend his Case Resistance Principle (Stowell 1981). Although CRP itself seems to have been given up, his observation on the interpretation of infinitives is still significant. Stowell noted that the presence or absence of COMP plays a vital role in interpreting infinitival tense. In the following section, we will observe the difference in temporal interpretations between two types of infinitival clauses, IP and CP infinitives, and propose binding conditions for infinitives.

4.1 Interpretation of IP and CP infinitives

The following are examples of infinitival complements to Exceptional Case Marking verbs.

- (37) a. John believes [Bill to be intelligent].
 b. John believed [Bill to be intelligent].

- (38) Bill_i is believed [t_i to be intelligent].

A complement clause to ECM verbs is IP, because 1) it does not block Case-marking from outside and 2) it does not block proper government from outside as in (37). Tense of IP-infinitives seems to be dependent

on that of the higher clause. For example in (37a) "Bill be intelligent" is true at the speech time or the time of John's believing. On the other hand, in (37b) the proposition in the complement is true at the past time, when John believed, and is not anchored to the speech time. Thus (37a) and (37b) are paraphrased as (39a) and (39b) respectively.

- (39) a. John believes that Bill is intelligent.
 b. John believed that Bill was intelligent.

The difference can be captured if we assume that infinitival INFL is a kind of anaphoric tense, which does not refer any specific time in itself but whose reference is dependent on an antecedent INFL. That this kind of INFL exists is quite natural if we regard tense as a referential expression. (In defense of this view, see Enç 1988.)

In contrast to ECM verbs, so-called control verbs take infinitival complements which are not IPs but CPs.

- (40) a. John persuaded Bill [Comp [PRO to leave the room]]
 b. John wants [Comp [Bill/PRO to leave the room]]

Unlike the cases of ECM verbs, embedded subject in 40b may not be passivized because there is CP to block proper government.

- (41) *Bill_i is wanted [Comp [t_i to leave]].

The interpretation of CP infinitives differs from that of IP infinitives in that CP infinitives usually have the meaning 'future' or 'unrealized events', so that they cannot be paraphrased into finite clauses as IP infinitives can.

- (42) a. John persuaded Bill (that) he (should) leave the room.
 b. *John persuaded Bill that he left the room.

In (42a) the complement clause has a subjunctive tense which is quite distinct from the tense in the main clause, which means that the infinitival tense is not dependent on nor bound by the antecedent INFL.

4.2 Binding of infinitives

Considering the different interpretation between IP and CP infinitives, we propose the following conditions.

(43) Binding of infinitives

- a. Infinitival INFL is anaphoric iff it is governed.
- b. Infinitival INFL is arbitrary in reference iff it is not governed.
- c. Governors are lexical categories and AGR.

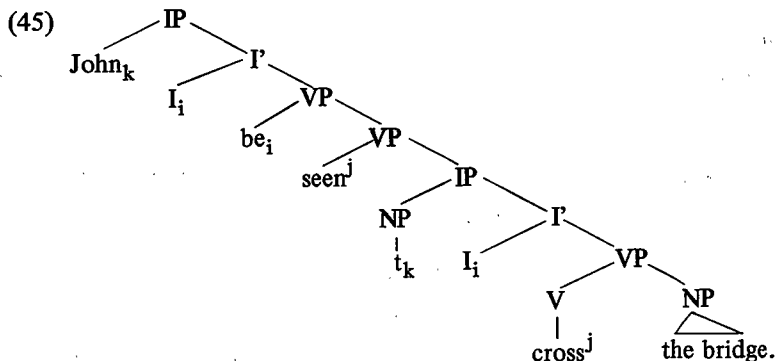
'Anaphoric' in 43a is used in the sense of the Binding Theory for nominals, and thus 'anaphoric' tense must be bound in its governing category. INFL in CP infinitives is not lexically governed and does not have a governing category. Those INFLs are not temporally bound by another tense and get the interpretation of 'future' or 'unrealized'. Interestingly, the formulation 43 parallels the conditions for PRO proposed by Bouchard 1982 and adopted by Hornstein-Lightfoot 1987.

- (44) a. PRO is anaphoric if it is governed.
- b. PRO is arbitrary in reference if it is not governed.

Using this device we can account for (35b).

- (35) b. Bill was seen *(to) cross the bridge.

(35b) is supposed to have the structure (45).



Cross is coindexed with *seen*. However, the passive participle is not coindexed with the main verb, and Time argument of *cross* is not satisfied through it. Since the infinitival INFL is governed by *seen*, it is bound within its governing category by the antecedent tensed INFL. Through this binding, *cross* is able to access Tense and its Time argument is satisfied.

In a similar way, next sentences are all properly licensed.

- (46) a. John saw Bill to be intelligent.
 b. John saw Bill to have left the room.
 c. John saw Bill to be making a fool of him.

Just like (25b), *see* and *be* (or *have*) may not be coindexed. But this time, those infinitives can access the main clause tense through the infinitival INFL to satisfy its Time argument. Since the time of seeing and the time of Bill's being intelligent is not directly related, we do not get the reading of 'direct perception'. Instead (46a) has the meaning similar to (47), in which the verb *see* has a meaning similar to *find*.

- (47) John saw that Bill was intelligent.

5. Conclusion

We have argued that possible complements to perception verbs and their interpretations can be accounted for by three independently motivated licensing devices.

NOTES

- 1) In this paper we are mainly concerned with progressive participles and not with passive participles in PVCs.
- 2) See Fabb (1984) and Suzuki (1988) among others.
- 3) α governs β iff α is X^0 and β is Y^{\max} and α commands β and there is no maximal projection between α and β . If α governs β , α also governs the head and the SPEC of β .
- 4) α c-commands β iff α does not dominate β , and every maximal projection that dominates α also dominates β .

5) Though we do not mention in the text, contrast between (33) and (34) is meant to capture the following paradigm.

- i) a. a boy crossing the street
- b. *a boy crossed the street

Perfective participles may not usually be used as modifiers or predicates without *have*. This is because of (34a).

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