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# Experiencer-Object and Prepositional Theme Constructions

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## 1. Introduction

It is well known that there are cross-linguistically three classes of psych verbs distinguished in terms of the linkage between the  $\theta$ -roles and cases; while they seem to share the same argument structure involving two  $\theta$ -roles, namely the experiencer and theme, the two arguments are assigned different Cases by the three classes. This also holds for English psych verbs, as illustrated in (1).

- (1) a. *Nominative experiencer, accusative theme*  
John loves Mary.  
b. *Nominative theme, accusative experience*  
The show amused Bill.  
c. *Nominative theme, dative experience*  
The idea appealed to Julie. (cf. Landau (2004))

Among these three classes, verbs exemplified in (1b), which Bouchard (1995) calls “Experiencer-Object (EO) verbs,” have received the most attention in the literature because they exhibit peculiar behavior in several respects.<sup>1</sup> More specifically, many attempts have been made to answer some serious questions about the structure of EO constructions, which arise from both conceptual and empirical considerations.

Conceptually, the association between  $\theta$ -roles and syntactic positions that EO verbs instantiate has often been regarded as problematic, in comparison with “Experiencer-Subject (ES) verbs” like those in (1a). If the surface order of the arguments directly reflects their base positions, it seems that the two classes link the same  $\theta$ -roles to different syntactic positions, as seen in (1). This difference would pose

1 By contrast, verbs exemplified in (1a) (Experiencer-Subject verbs) seem basically nondistinct in behavior from nonpsychological stative verbs like *have*, and hence need no special treatment, as Bennis (2004) suggests.

an obvious problem to Baker's (1988) "Uniformity of Theta Assignment Hypothesis (UTAH)" and even to weaker versions such as Larson's (1990) "Relativized UTAH," which require the mapping between  $\theta$ -roles and syntactic positions to be uniform in a certain sense, as in (2), as desirable from a learnability perspective.<sup>2</sup> Pesetsky (1995) labels this kind of problems as "linking problems."

- (2) a. *Uniformity of Theta Assignment Hypothesis (UTAH)*  
 Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-Structure. (Baker (1988: 46))
- b. *Relativized UTAH*  
 Identical thematic relationships are represented by identical relative hierarchical relations between items at D-Structure. (Larson (1990: 601))

A more serious difficulty arises for the (relativized) UTAH, when another class of psych predicates is taken into account. Many EO verbs have morphologically related non-causative counterparts, which are usually adjectives in English. Although they appear to involve the same  $\theta$ -roles as EO verbs, again the surface order of the two arguments is different in the cases of the former and latter, as in (3)–(5): the psych predicates in the (a) examples, unlike the EO verbs in the (b) examples, have experiencer subjects and prepositional objects serving as themes. For convenience of reference, I will henceforth refer to them as "prepositional theme (PT) predicates."

- (3) a. Bill was angry at the article in the Times.  
 b. The article in the Times angered Bill. (cf. Pesetsky (1995: 56))
- (4) a. Bill was {satisfied/content} with the Chinese dinner.  
 b. The Chinese dinner {satisfied/contented} Bill. (ibid.)
- (5) a. John is bored with the problem of lexical entries.  
 b. The problem of lexical entries bored John. (ibid.: 57)

The contrasts in (3)–(5) seems more problematic than that between (1a) and (1b), because the morphological relatedness between the predicates makes it more likely that in the (a) and (b) examples, the shared roots associate the same  $\theta$ -roles with the same positions, or with positions in the same hierarchical relation.<sup>3</sup>

2 The ordering of  $\theta$ -roles in the thematic hierarchy is a controversial issue among researchers that assume some form of the relativized UTAH; Larson himself presents the hierarchical order in (ia), and several alternatives are given in (ib–e).

- (i) a. Agent > Theme > Goal > Obliques (manner, location, time, ...) (Larson (1988: 382))  
 b. Agent > Location/Source/Goal > Theme (Jackendoff (1972: 43))  
 c. Agent > Instrument > Patient/Theme > Goal/Location (Baker (1989: 544))  
 d. Cause > Other > ... (Grimshaw (1990: 24))

The orderings in (i) have different implications for the relative hierarchical relation between the experiencer and theme roles, though they might not be necessarily inconsistent; if the experiencer is classified with the goal role, it is predicted to be generated lower than the theme in (ia) and (ic) whereas (ib) and (id) predict its structural superiority. Whichever role is assumed to be higher, however, EO verbs create a problem for the relativized UTAH, given that they share the identical  $\theta$ -roles with other classes of psych predicates.

3 Since what causes linking problems is just the conflict between the hierarchical relations of the  $\theta$ -roles suggested by EO verbs and other psych predicates, it is in principle also possible to solve

On the other hand, it has been observed that EO verbs have peculiar syntactic properties which suggest that the structure of EO verbs crucially differ from those of ordinary transitive verbs, including ES verbs. In particular, the binding possibilities in EO constructions have often been taken to indicate that their derivation involves some sort of “argument reversal.” The most discussed examples are of the type exemplified in (6).

- (6) a. Pictures of himself please John. (Lebeaux (1985: 349))  
 b. These rumors about himself worry John more than anything else. (McGinnis (2000: 115))  
 c. Each other’s supporters worried Freud and Jung. (ibid.)  
 d. Each other’s remarks annoyed John and Mary. (Pesetsky (1995: 43))

In (6) the objects of the EO verbs bind the anaphors contained in their subjects. In other words, the binding relations in (6) are established without c-command of the anaphors by the intended antecedents. Such backward binding relations are of course generally disallowed, as illustrated by the verbs of other classes in (7).

- (7) a. \*Pictures of himself fell on John.  
 b. \*These rumors about himself describe John better than anything else. (McGinnis (2000: 115))  
 c. \*Each other’s supporters telephoned Freud and Jung. (ibid.)  
 d. \*Each other’s stupid friends eventually killed John and Mary. (Pesetsky (1995: 43))

The mysterious binding facts in (6) can be accounted for if the subjects in (6), and hence the anaphors contained in them, are c-commanded by the object antecedents in some stage of the derivation. The binding properties of EO verbs, therefore, have motivated many analyses to assume that one of their two arguments raises across the other, making available the c-command relation between them opposite to the surface one. Obviously, two types of implementations of this idea are possible: to assume

them by arguing that the former rather than the latter is the correct hierarchy. There is, however, general agreement in the literature that it is EO verbs rather than the other classes that should be taken as exceptional in terms of linking, and hence require some explanation. Apart from their syntactic peculiarities, there seems to be some reason to take it as typical of psych predicates that experiencers surface as their subjects. In particular, transitive psych predicates, namely dyadic psych predicates whose arguments are both not oblique, generally have experiencer subjects, with the exception of EO verbs. For example, transitive psych adjectives like *afraid* also instantiate the hierarchical order experiencer > theme. Furthermore, adjectives such as *sure* may provide an argument for the view that this surface order directly reflects the base hierarchical relation: they exhibit a diathesis alternation closely parallel to the ergative alternation in the verbal domain, as shown in (i).

- (i) a. His success is sure.  
 b. Mary is sure of his success.

The paradigm in (i) suggests that the experiencer, which is absent in the monadic construction, is the external argument and hence generated higher than the theme, just as the agent of verbs like *break*. Note, on the other hand, that it is less clear whether the alternation between EO verbs and their non-causative counterparts can also be identified with the ergative alternation, because the former generally does not involve a change in the number of arguments. I will return to this issue in section 2.3.

raising of the subject across the object, or of the object across the subject. Most previous analyses of EO constructions fall under either type that attempt a structural account. Here I call these two types of approaches the “subject movement approach” and “object movement approach.”

Although both approaches have been claimed to account not only for the binding possibilities seen in (6), but also for several other properties of EO verbs, there still remain some facts about their behavior that are difficult to accommodate. In particular, a closer examination of relevant data suggests that the binding properties of EO constructions resist simple solutions of the kind offered by the movement approaches, raising questions as to the nature of backward binding per se.

The main purpose of this paper is to reveal the structure of EO constructions to offer an account of their characteristic properties, focusing on the question whether their derivation involves argument reversal. For this purpose, I begin with the examination of facts about two much discussed phenomena observed in EO constructions, i.e. their binding properties and the Target/Subject Matter (T/SM) restriction, with special attention to how they can be explained in the two movement approaches.

The organization of this paper is as follows. After briefly sketching the basic features of the two approaches, section 2 makes a detailed observation of the behavior of EO verbs with respect to binding and the T/SM restriction, examining the interaction between the related facts and the assumption of subject/object raising. Some theoretical matters concerning these approaches are also discussed in this section. On the basis of these discussions, section 3 proposes the structure and derivation of EO constructions, and an analysis of their peculiar properties seen above is presented in section 4. Finally, I state the conclusion of this paper in section 5.

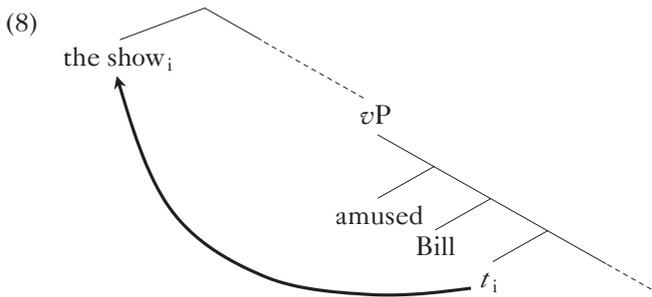
## 2. The Two Movement Approaches and Peculiar Behavior of EO Verbs

### 2.1. The Subject Movement Approach and the Object Movement Approach

As noted above, structural solutions to backward binding facts in EO constructions are classified into two approaches according to which of the two arguments is assumed to raise. Although I simply define the subject and object movement approaches as those which assume argument reversal to be achieved by raising of the subject and the object, respectively, some concomitant assumptions are naturally made in each approach to constitute a plausible analysis.

The structure assumed for EO constructions in the subject movement approach is as in (8), where the subject has raised from some lower position than the object.<sup>4</sup>

4 In (8) and (9), the label *vP* is intended just as a cover term for verbal projections within which the object of typical transitive verbs is assigned a  $\theta$ -role and Case. For Belletti and Rizzi, Pesetsky

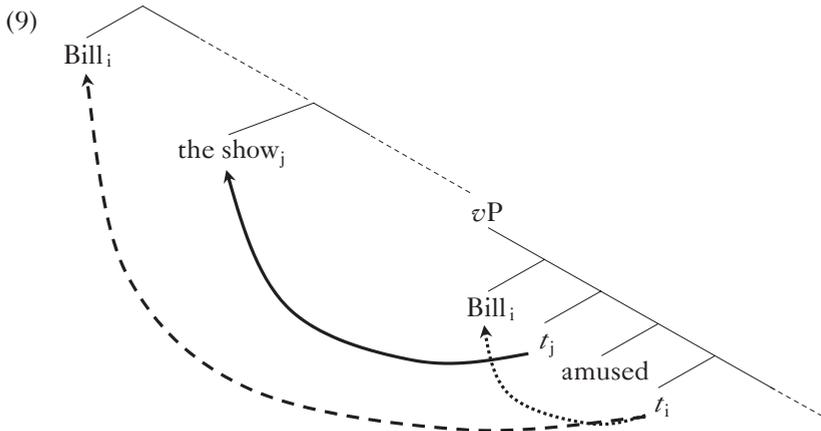


Since the subject surfaces in a higher position than the object, the movement in (8) must be overt, though it can involve some intermediate steps. The base position of the subject is necessarily lower than the object, but the step across the object itself does not have to originate in it. No matter how many steps are assumed, they must be all A-movements because the final landing site is the subject position. The simplest interpretation of (8), however, is of course that the subject is base-generated in the position of the trace, and directly raises to its surface position. Among analyses that take the subject movement approach, Belletti and Rizzi (1988) and Bennis (2004) adopt this view, while Pesetsky (1995) assumes an intermediate landing site in the highest specifier of VP.

Pesetsky is also special in that the subject of EO verbs is regarded as a “derived external argument,” minimizing the difference between EO verbs and typical transitive verbs. On more standard assumptions, the subject movement approach forces a nontransitive character on EO verbs because their lack of an external argument follows as far as their highest argument, namely the object, is internal. Although Bennis’s structure shares the absence of an external argument with Belletti and Rizzi’s, they differ in the properties assigned to the verbal head: the former is transitive in terms of Case assignment, whereas the latter is characterized as unaccusative.

The object movement approach, on the other hand, assumes the structure roughly schematized in (9), which shows two possibilities for the landing site of the involved raising of the object: the object may raise to some higher position either than the surface position of the subject or than its base position, under the VP-internal subject hypothesis.

and Campbell and Martin, for example, it should count as VP, with the object assigned accusative Case in situ, whereas for Fujita, it is AgroP, containing the derived position of the object. Its exact categorial status depends on general assumptions about the clause structure, which is not immediately relevant to the discussion here.



In contrast to that in (8), the movement in (9) must be covert, given the surface hierarchical order of the two arguments. Although it is again possible that it consists of a succession of shorter steps, no intermediate landing site is assumed in many previous analyses that take the object movement approach, such as Campbell and Martin (1989), Park (1992), Fujita (1993, 1996) and Landau (2004). Furthermore, nothing in the structure of (9) would prevent one from arguing that the subject is the external argument of the verb; in the object movement approach, EO verbs are usually characterized as transitive at least in terms of argument structure, while some distinctive lexical and/or structural properties are introduced to distinguish them from canonical transitive verbs.

## 2.2. EO Verbs and Backward Binding

### 2.2.1. Binding Properties of EO Verbs

In section 1 we have seen that EO verbs allow backward binding, making anaphors contained in their subject referentially dependent on their object, as in (6). The reversal of binding relations between their subject and object is in fact observed in a broader range of contexts. For example, backward variable binding is also possible in the same configuration as in (6): EO verbs allow their quantified object to bind variable pronouns contained in their subject without weak crossover effects, as in (10a, b), which are contrasted with the ungrammatical example with a nonpsych verb in (10c).

- (10) a. His<sub>i</sub> health worries every patient<sub>i</sub>. (Reinhart (2000: 53))  
 b. His<sub>i</sub> promotion pleases everyone<sub>i</sub>. (Fujita (1993: 384))  
 c. \*His<sub>i</sub> friend hit everyone<sub>i</sub>. (ibid.)

The grammaticality of the examples in (10a, b) as well as those in (6) suggests that EO verbs create contexts in which the direction of anaphoric dependencies itself can be from their object to subject rather than ones in which specific anaphoric items exhibit special behavior.

The availability of such dependencies is explained in both movement approaches by assuming that the derivation of EO constructions involves a stage where the object c-commands the subject. In the subject movement approach, the relevant c-command relation holds before the raising of the subject illustrated in (8). For concreteness, suppose, under the copy theory of movement, that any copy in a chain can be interpreted at the semantic interface for satisfaction of Condition A or variable binding.<sup>5</sup> On this view, the examples in (6a) and (10a) are given the structures in (11a) and (11b), respectively, in the subject movement approach. (The unpronounced copies are put between angle brackets.)

- (11) a. [ [pictures of himself] ...  
           [<sub>CP</sub> please [ John<sub>i</sub> ... [ <pictures of himself;<sub>i</sub>> ... ]]]]  
       b. [ [his health] ...  
           [<sub>CP</sub> worries [ [every patient]<sub>i</sub> ... [ <his<sub>i</sub> health> ... ]]]]

In the structures in (11), the objects c-command the base copies of the anaphor and variable pronoun within the subjects, which suffices for the establishment of the binding relation between the former and the latter. Note here that the object QP in (11b) need not undergo QR for the pronoun to fall within its scope, inducing no weak crossover effects.

The object movement approach, on the other hand, allows the object to c-command the subject after the former raises covertly, as in (9). In this approach, the structures of (6a) and (10a) are as in (12), or as in (13).

- (12) a. [ <John;<sub>i</sub>> ... [ [pictures of himself]<sub>i</sub> ...  
           [<sub>CP</sub> <picture of himself> [ please [ John ... ]]]]]]  
       b. [ [<every patient;<sub>i</sub>> [ [his<sub>i</sub> health] ...  
           [<sub>CP</sub> <his health> [ worries [ [every patient] ... ]]]]]]  
       (13) a. [ [pictures of himself] ...  
           [<sub>CP</sub> <John;<sub>i</sub>> [ <picture of himself;<sub>i</sub>> [ please [ John ... ]]]]]]  
       b. [ [his health] ...  
           [<sub>CP</sub> <[every patient]<sub>i</sub>> [ <his<sub>i</sub> health> [ worries [ [every patient] ... ]]]]]]

In (12) and (13), the higher copies of the objects may be interpreted at the semantic interface to c-command the pronounced or base copies of the subjects, which contain the anaphor and variable pronoun. The covert raising of the object must not fall under

5 Lebeaux (1991) distinguishes two types of conditions on indexing: positive conditions such as Condition A and negative conditions such as Condition C. The grammar checks relevant elements throughout the derivation in either case, but they are checked for fulfillments of positive conditions, and for violations of negative conditions. If his dichotomy is correct, variable binding counts as a positive condition, and hence is predicted to be satisfied at any stage of the derivation, as Condition A.

quantificational A'-movement; otherwise, it would result in weak crossover.<sup>6</sup> For Fujita (1993, 1996), movement of the object is clearly an instance of A-movement, because it raises to [Spec, Agr<sub>OP</sub>] for Case reasons. Landau (2004) also explicitly characterizes its landing site as an A-position. Although the nature of raising of the object is more or less unclear in many other analyses, there seems to be no reason that it should count as A'-movement.

However, another type of binding data further suggest that EO verbs not only allow backward binding, but also disallow forward binding. They differ remarkably from other classes of verbs in that their subject cannot bind anaphors in object position, as the contrast between (14a, b) and (14c) illustrates.

- (14) a. \*The men concerned each other. (Zubizarreta (1992: 233))  
 b. ?\*They {frighten/worry} themselves. (Bouchard (1995: 285))  
 c. They {fear/hate} themselves. (ibid.)

The ungrammaticality of (14a, b) shows that EO verbs behave in terms of binding unambiguously as if their object were hierarchically superior to their subject. The subject and object movement approaches would assign the example in (14a) the structures in (15) and (16), respectively.

- (15) [ [the man]<sub>i</sub> ... [<sub>CP</sub> concerned [ [each other]<sub>i</sub> ... [ <[the man]<sub>i</sub>> ... ]]]]  
 (16) a. [ <[each other]<sub>i</sub>> ... [ [the man]<sub>i</sub> ...  
           [<sub>CP</sub> <[the man]<sub>i</sub>> [ concerned [ [each other]<sub>i</sub> ... ]]]]]]  
 b. [ [the man]<sub>i</sub> ... [<sub>CP</sub> <[each other]<sub>i</sub>> [ <[the man]<sub>i</sub>> [ concerned  
           [ [each other]<sub>i</sub> ... ]]]]]]

There are two lines of reasoning possible in both approaches to rule out examples such as (14a, b): they are ungrammatical because Conditions C and B are violated with the R-expression and pronoun (locally) bound by the coindexed anaphors, or because Condition A is violated with no local antecedent available to the anaphors. The former explanation, which is adopted by Landau (2004), seems untenable, however. An argument against it comes from the fact that the examples of forward binding in (17) are bad on a par with those in (14a, b).

- (17) a. \*The children concerned each other's parents. (Zubizarreta (1992: 233))  
 b. \*Those clowns usually amuse each other's children. (Johnson (1992: 268))

Since in (17) the anaphors are not the objects of EO verbs themselves, but contained in them, the R-expressions are not c-commanded by the coindexed elements at any stage of the derivation even in the movement approaches, exempted from Condition C violations. This clearly suggests that it is the anaphors rather than the R-expressions and pronoun that are responsible for the ungrammaticality of the

6 Lasnik and Stowell (1991) observe that weak crossover configurations with nonquantificational operators only yield very weak violations, if any. Therefore, the possibility is not excluded that the raising of the object in question is characterized as A'-movement with the nonquantificational nature, such as topic movement.

examples both in (14a, b) and in (17).<sup>7</sup>

If the examples in (14a, b) are ruled out by Condition A, however, the question arises why the subjects cannot be appropriate antecedents of the anaphors despite their similarity to (14c) in the surface configuration. Given that any copy is available to satisfy Condition A, the most plausible reason why it is violated in (14a, b) is that the subjects are by no means local enough to the objects wherever they are interpreted, i.e., no copy of the subjects c-commands any copy of the objects in their local domain. Such an account is feasible in the subject movement approach as far as the subject directly raises from a lower position than the object to its surface position; as in Kaneko (1999a), Fischer (2004), Arimoto and Murasugi (2005) and Hicks (2006), among others, it can be argued that the relevant local domain is  $vP$ , excluding the subject position itself, because in typical transitive constructions such as (14c), the subject always leaves a copy in [Spec,  $vP$ ], which may be taken as a local antecedent of an anaphor in object position.<sup>8</sup> On the other hand, it is rather difficult to give a parallel account in the object movement approach and in Pesetsky's (1995) analysis, because EO verbs would not differ from canonical transitive verbs in that the base position of their subject c-commands that of their object within  $vP$ . It is quite questionable whether a part of  $vP$  that excludes the former may constitute the local domain for an anaphor in object position.

### 2.2.2. Backward Binding without EO Verbs

We have so far seen that EO verbs are peculiar in that they allow backward binding, but it is not restricted to this particular class of items; it has been observed that backward binding is also possible in certain constructions that do not involve EO verbs. Although it is highly desirable to provide a unified account of backward binding phenomena in both EO and these constructions, some examples seem to defy solutions offered by the movement approaches.

A significant observation is that backward binding is allowed in periphrastic psych constructions with non-experiencer subjects, some of which consist of PT predicates embedded under causative verbs, directly corresponding to lexical EO constructions, as in (18).

- (18) a. Stories about himself always make John worry. (Campbell and Martin (1989: 45))  
 b. Pictures of each other make us happy. (Pesetsky (1995: 43))

7 Furthermore, to rule out (14a) by Condition C, one has to assume that it must apply at a stage where the object c-commands the subject. However, this is not the case; the possibility of the examples in (i) indicates that Condition C does not have to apply at relevant stages.

(i) a. John's pictures worry him.  
 b. Mary's stories annoy her.  
 c. The children's descriptions amused them. (Johnson (1992: 265))

8 Some of the studies mentioned here identify the local domains for binding more generally as phases, one of which  $vP$  counts as. Whatever the status of phases in the binding theory is, however,  $vP$  can be independently regarded as the local domain under the VP-internal subject hypothesis.

- c. Each other's remarks made John and Mary angry. (ibid.)  
 d. These stories about herself made Mary nervous. (ibid.: 44)  
 e. ?These stories about himself made John anxious to the extreme.  
 (Bouchard (1995: 269))

These examples pose a problem for most analyses that take the subject movement approach, because they attribute the possibility of backward binding to the special VP structure of EO verbs, in which the subject is generated below the experiencer object. In (18), the experiencers are selected by the PT predicates, while the subjects are clearly introduced by the separate causative verb *make*. To explain backward binding phenomena in a unified way, these analyses would be forced to assume not only a deeply embedded base position for the subjects, but also the unexpected absence of the external causers from the argument structure of *make* in (18).

An exception that might avoid this problem under the subject movement approach is Pesetsky's (1995) analysis. He argues that the subject of EO verbs is not a selected argument of their root, but introduced as causer argument selected by the null preposition *CAUS*. Since *CAUS* has the status as an "adjunct" preposition like because (of), and as such, is embedded deeper than selected arguments of the verb, causers can also be base-generated lower than the experiencers in (18). While causers raise to the subject position in EO constructions, Pesetsky suggests that they are deleted together with *CAUS* when their semantics are represented elsewhere in the structure. As the examples in (18) involve the causers selected by the causative verb *make* independently of the PPs headed by *CAUS*, the latter are deleted under the semantic identity with the former, as illustrated in (19).

- (19) [VP [<sub>Causer</sub> each other's remarks ] [<sub>V'</sub> make [<sub>AP</sub> [John and Mary] [<sub>A'</sub> angry  
 {<sub>PP</sub> ~~*CAUS*~~ {<sub>Causer</sub> ~~each other's remarks~~ } } ] ] ] ] ]

Consequently, the subjects in (18) behave as if they were c-commanded by the experiencers by virtue of their identity with the deleted causers in the deepest position, licensing the anaphors contained in them.

However, if movement-like relations can be established between the subjects and deeply embedded positions in (18), as Pesetsky assumes, some cases of backward binding still remain unexplained. For instance, backward binding is also possible when the antecedent is not selected either by the matrix verb or by the embedded predicate, but a genitive phrase within one of their arguments, as in (20).

- (20) a. Pictures of himself make John's head hurt.  
 (Campbell and Martin (1989: 45))  
 b. Stories about herself cause Mary's head to ache. (ibid.)  
 c. Each other's threats made [John and Bill]'s skin crawl.  
 (Bouchard (1995: 297))

In these examples, the assumed lower positions associated with the subjects would be c-commanded by the arguments of the embedded predicates, but not by the intended antecedents. The same problem arises when the construction is monoclausal, as in

(21); even if the subjects themselves raise across the objects, the genitive phrase within the latter never c-command the anaphors contained in the former.

- (21) a. These rumors about himself<sub>i</sub> caught John<sub>i</sub>'s attention.  
 b. Each other<sub>i</sub>'s nasty remarks really ruffled [John and Mary]<sub>i</sub>'s feathers.  
 (ibid.)

Examples like those in (20)–(21) can also be problematic for analyses that take the object movement approach, depending on how raising of the object is characterized. If the object of EO verbs moves across the base position of their subject for Case reasons, as Fujita (1993, 1996) argues, the possibility of backward binding in (20)–(21) cannot be accounted for, because it is not the genitive phrases, but the DP arguments containing them that should raise to be assigned accusative Case. Then, the anaphors would not be c-commanded by their antecedents at any stage of the derivation.

In other analyses that adopt the object movement approach, such as Campbell and Martin (1989) and Park (1992), on the other hand, raising of the object in EO constructions is characterized as “experiencer raising,” referring to the semantic role of what it applies to. Given this nature of the operation, it is predicted that in (20)–(21) the genitive phrases rather than the DPs containing them are selected to undergo raising across the subjects; the former count as experiencers, while the latter do not. As a result, the backward binding phenomena in these examples are reduced to c-command of the anaphors by the antecedents at LF in the same way as those in EO constructions. If this is correct, however, a question arises as to how the genitive experiencers can move out of the embedded subjects and the objects in (20) and (21), respectively, for extraction of them apparently violates the Left Branch Condition. Campbell and Martin (1989) offer a solution to this question: LF incorporation of their head nouns into the governing verbs renders them accessible to movement under lexical government by the latter, which follows from Baker’s (1988) Government Transparency Corollary.

- (22) a. Stories about himself hurt John’s head.  
 b. [<sub>VP</sub> [<sub>V</sub> [<sub>N</sub> head]<sub>i</sub>]-[<sub>V</sub> hurt]] [<sub>NP</sub> John’s [<sub>ϕ</sub>]<sub>i</sub>] (Campbell and Martin (1989: 50))

Although the incorporated noun heads the object of the incorporating verb in (22), this incorporation is also applicable in (20), because Campbell and Martin argue that embedded predicates in such examples are generally unaccusatives, base-generating their arguments containing genitive experiencers in object position. Consequently, their experiencer raising analysis can explain backward binding phenomena whether the construction is monoclausal or biclausal, and is naturally extended to more idiomatic psych constructions like those in (23).

- (23) a. The photos of himself<sub>i</sub> made John<sub>i</sub>'s face turn red.  
 b. The rumors about herself<sub>i</sub> made Mary<sub>i</sub>'s hair stand up.  
 c. Each other<sub>i</sub>'s teasing really got their<sub>i</sub> dander up.  
 d. The jokes about herself<sub>i</sub> got Mary<sub>i</sub>'s goat. (Bouchard (1995: 297))

In (23), while it is rather difficult, if possible, to identify which items make a crucial contribution to the psychological semantics of the constructions, it is clear that the genitive antecedents are interpreted as experiencers, and they can be claimed to raise on the assumption that their head noun is generated in object position.

On closer inspection, however, it turns out that the solution proposed by Campbell and Martin is not always available. Backward binding of anaphors is likewise possible in periphrastic psych constructions with more complex internal structures that embed their experiencer in far deeper positions, as in (24).

- (24) The picture of himself in *Newsweek* shattered the peace of mind that John had spent the last six month trying to restore. (Pollard and Sag (1992: 19))

Although the sentence in (24) involves a DP identifiable as an experiencer, namely *John*, it is embedded within the relative clause modifying the object. An analysis that assumes experiencer raising must argue that John covertly moves into the main clause to a position high enough to c-command the anaphor contained in the matrix subject, which would clearly result in a Complex NP Constraint violation.

More crucially, backward binding phenomena are in fact not restricted to psych constructions; they are also observed in certain nonpsych constructions, which can be either periphrastic, as in (25), or headed by lexical nonpsych verbs, as in (26).

- (25) a. Those rumors about himself made John behave more carefully.  
 b. Pictures of herself used to make Sue blush.  
 c. Pictures of each other caused John and Mary to start crying.  
 d. Each other's criticisms forced John and Mary to confront their problem.  
 (Pesetsky (1995: 44))
- (26) a. ?Each other's stupid remarks eventually killed John and Mary.  
 b. ?Each other's criticism harmed John and Mary.  
 c. ?Those pictures of himself ultimately destroyed Bill.  
 d. ?These nasty stories about himself broke John's resistance.  
 (Bouchard (1995: 296))

Since there is no DP involved in these examples that is taken as an experiencer at least in the same sense as those in psych constructions, experiencer raising would fail to establish the expected c-command relations between the anaphors and their antecedents. Note that the grammaticality of the examples in (25)–(26) is also not explained in the subject movement approach, because they do not contain EO verbs, and the antecedent can be embedded within a DP, as in (26d). What is shared by all of these examples, and the psych constructions involving backward binding we have so far seen, is their nonagentive causative semantics and the status of their arguments containing the anaphors as causers. In this respect, Pesetsky's generalization in (27) seems to be on the right track, though his particular analysis cannot account for some cases, as noted above.

- (27) A Causer argument of a predicate  $\pi$  may behave as if c-commanded by an argumental DP governed by  $\pi$ . (Pesetsky (1995: 49))

### 2.3. The Target/Subject Matter Restriction

In this subsection, I examine another phenomenon peculiar to EO verbs that has often been discussed in connection with the movement approaches to them: the cooccurrence restriction is imposed on EO verbs that is referred to by Pesetsky (1995) as the “Target/Subject Matter (T/SM)” restriction.

Let us begin with the observation of basic facts. As noted in section 1, many EO verbs have morphologically related intransitive counterparts, namely PT predicates. While PT predicates can select prepositional theme arguments that refer to objects of emotion, they generally cannot participate in the corresponding EO constructions, as the contrast between (28) and (29) show.<sup>9</sup>

- (28) a. Bill was angry at the government.  
 b. Bill was satisfied with his trip to Beijing.  
 c. John worried about the veracity of Bill’s alibi.  
 d. John is bored with his life as a linguist.
- (29) a. \*The article in the Times angered Bill at the government.  
 b. \*The Chinese dinner satisfied Bill with his trip to Beijing.  
 c. \*The television set worried John about the veracity of Bill’s alibi.  
 d. \*The problem of lexical entries bores John with his life as a linguist.

(Pesetsky (1995: 60))

The existence of this restriction is surprising if the alternation between EO verbs and PT predicates is understood as parallel to the ergative alternation based on the transitivity and causative semantics involved in the former. As in (30), prepositional arguments of unaccusative verbs like *break* may cooccur freely with their causative counterparts in general.

- (30) a. John broke the cookie into little pieces.  
 b. Sue grew the seeds into beautiful plants.  
 c. Sue flew the plane to Los Angeles.  
 d. Bill rested the coffee cup on the table. (ibid.: 214)

Moreover, the T/SM restriction is not observed in periphrastic counterparts of EO constructions, as seen in (31).

- (31) a. The article in the Times made Bill angry at the government.  
 b. The Chinese dinner made Bill satisfied with his trip to Beijing.  
 c. The television set made John worry about the veracity of Bill’s alibi.  
 d. The problem of lexical entries made John bored with his life as a linguist. (ibid.: 61)

Given that there is no crucial difference in meaning between (29) and (31), the

<sup>9</sup> Pesetsky (1995) distinguishes two thematic labels of these prepositional arguments, namely “Target” and “Subject Matter,” hence the name Target/SM restriction. Since this distinction is not important for the present discussion, here I refer to them simply as themes.

grammaticality of the latter suggests that the ungrammaticality of the former is not attributed to semantic factors. Then, the question arises why these prepositional arguments cannot occur in EO constructions.

In the subject movement approach, there is a straightforward answer to this question available: the T/SM restriction is accounted for if the subject of EO verbs, which is claimed to be generated below their object in the subject movement approach, appears as the prepositional argument in the corresponding PT constructions, i.e., the former never cooccur with the latter because they are the identical arguments bearing the same  $\theta$ -role. This identification seems to be given some justification by the intuition that the subject of EO verbs, unlike that of transitive verbs like *break*, is semantically associated with the predicate in a fairly similar way to the prepositional argument of their intransitive counterparts, as seen in (3)–(5). In this account, the surface difference between the themes in EO and PT constructions may be attributed to their difference in the Case-assigning property. Since EO verbs assign Case to their experiencer, their theme raises to the subject position to get nominative Case, as in (32a), whereas the experiencer of PT predicates must be the subject of the construction due to their lack of the ability to assign Case, which requires another Case assigner for their theme, namely a preposition, as in (32b).

(32) a.  $[_{TP} T [_{vP} \text{anger} [ \text{Bill}_{Exp} \dots [ \text{the article}_{Th} ] ] ] ]$

b.  $[_{TP} T \dots [_{AP} \text{angry} [ \text{Bill}_{Exp} \dots [*(P) \text{the article}_{Th} ] ] ] ]$

This is probably the simplest solution; if the subject of EO verbs and the prepositional object of PT predicates bear the same  $\theta$ -role, the T/SM restriction is no longer a problem.

A closer examination of the semantic and syntactic properties of EO constructions, however, raises grave doubts about the feasibility of this solution, suggesting that they are thematically distinct. A first argument against their thematic identity is provided by Pesetsky (1995) based on a careful comparison between EO and PT constructions. He reveals that EO constructions are not semantically equivalent to the corresponding PT constructions, with the subject of the former making a different contribution to interpretation from that made by the object of the latter. Let us compare (33) with (34).

- (33) a. Bill was very angry at the article in the *Times*.  
 b. John worried about the television set. (Pesetsky (1995: 56))
- (34) a. The article in the *Times* {angered/enraged} Bill. (ibid.)  
 b. The television set worried John. (ibid.: 57)

In (33), the prepositional objects specify the objects of the emotion denoted by the predicates; (33a) entails, for example, that Bill evaluates some aspect of the article itself negatively. The subjects in (34), on the other hand, tell us nothing about the

objects of emotion; rather, they just specify the cause of the emotion denoted by the verb. Accordingly, the sentence in (34a) is entirely consistent with a situation where Bill was angry at something other than the article in the *Times*. The view that the two arguments are distinguished in this respect is supported by the marginal possibility of the examples in (35), where prepositional objects of PT predicates are added to EO constructions as afterthoughts.

- (35) a. ?The article in the *Times* angered Bill—but not at the government.  
 b. ??The television set worried John—but not about the veracity of Bill.  
 (ibid.: 301)

In the same vein, Iwata (1993, 1995) points out that it is perfectly clear what unacceptable examples like those in (29) mean, which indicates that they are just not grammatical. These are not expected if the subject of EO verbs and the object of the corresponding PT predicates bear the same  $\theta$ -role; by definition, they must be semantically related to their predicates in an identical manner, wherefore the examples in (29) would not receive any coherent interpretations.

The fact that EO and PT constructions yield different truth conditions further confirms their semantic nonequivalence. When the sentences in (36) are coordinated with one of them negated, negation of the (b) sentence results in a contradictory proposition, as in (37a), whereas negation of the (a) sentence does not, as in (37b). It seems to be generally the case that the entailment in (38a) holds, but its converse in (38b) does not.<sup>10</sup>

- (36) a. John worried about Mary's poor health.  
 b. Mary's poor health worried John.  
 (37) a. John worried about Mary's poor health, but Mary's poor health did not worry John. [contradiction] (Pesetsky (1995: 57))  
 b. Mary's poor health worried John, but John did not worry about Mary's poor health. [noncontradiction] (ibid.: 58)  
 (38) a. If  $X \text{ Pred}_{PT} P Y$ , then  $Y V_{EO} X$ . [true]  
 b. If  $Y V_{EO} X$ , then  $X \text{ Pred}_{PT} P Y$ . [false]

These observations are not surprising given that the subject of EO verbs bears a

10 This difference in truth conditions is also confirmed by comparing the complex sentences in (i), where the two sentences in (28) are conjoined by *because* or *whenever*.

- (i) a. Because/Whenever John worried about Mary's poor health, Mary's poor health worried John. [tautology]  
 b. Because/Whenever Mary's poor health worried John, John worried about Mary's poor health. [nontautology] (Pesetsky (1995: 58))

The statement in (ia), whose main clause is the EO construction, is regarded as a tautology, while it is not tautological to say as in (ib), where the PT construction serves as the main clause. The results are consistent with the generalization in (38): given that (38) is correct, (ia) is saying nothing more than a natural consequence, but (ib) is asserting something substantial.

distinct  $\theta$ -role from that of the prepositional object of their PT counterparts.<sup>11,12</sup>

Another argument comes from the fact that there exist some exceptions to the T/SM restrictions, as Pesetsky (1995) observes. In verb-particle EO constructions, for example, prepositional objects allowed in their PT counterparts can occur almost freely despite the presence of transitive subjects, as the examples in (39) show.

- (39) a. The election results really riled Sue up at the media.  
 b. The check calmed Bill down about the accident.  
 c. Her remarks really got Bill down about it.  
 d. The lectures turned Bill on to classical music.  
 e. The article really pissed Bill off at Mary. (Pesetsky (1995: 61))

The existence of such examples can by no means be accommodated in an analysis that identifies the  $\theta$ -role of the subject of EO verbs and that of the object of the corresponding PT predicates, because it inevitably predicts that the T/SM restriction has no exceptions. Given their thematic distinction, on the other hand, the restriction can leave room for exceptions, depending on how it is explained.

If the above facts indicate that the subject of EO verbs bear a distinct  $\theta$ -role from the prepositional object of PT predicates, the T/SM restriction poses a real problem that requires some alternative explanation. On this view, Pesetsky (1995) offers a structural solution under the subject movement approach. As mentioned above, he claims that the subject of EO verbs originates as an object of the null preposition

11 Note that the interpretive difference between EO and PT constructions is not attributable simply to the causative semantics involved in the former, which is absent from the latter. If EO verbs and PT predicates assign identical  $\theta$ -roles to their arguments while only the former are causative, as Bennis (2004) assumes, it is indeed predicted that they differ in truth conditions, but not as generalized as in (38); contrary to the fact, situations where (37b) is true would be more restricted than ones where (37a) is true, because the denoted psychological state must be caused by something in the former, but need not in the latter. Consider, for example, the pair in (i), for which the converse entailment, if either, seems to hold.

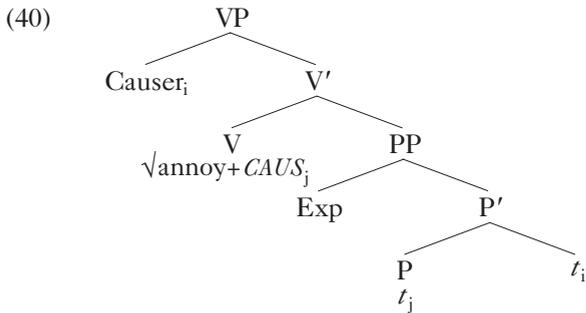
- (i) a. The door {opened/was open}.  
 b. The door was opened.

12 Pesetsky makes another observation that indicates that subjects of EO verbs are thematically distinct from prepositional objects of PT predicates. In French and Russian, some elements allowed as the former are disallowed as the latter, as demonstrated in (i) and (ii).

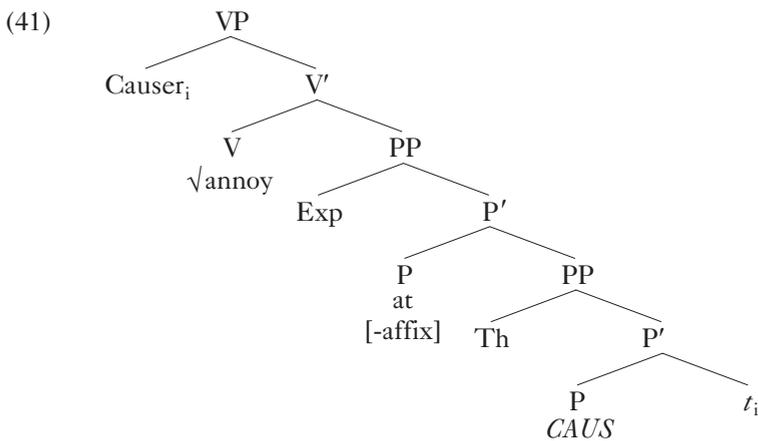
- (i) a. {Paul/Cette table/Le bruit qu'on fait sur cette histoire/Que Jules soit sorti} étonne Marie.  
 {Paul/this table/the fuss made about this story/that Jules left} amazes Marie (Pesetsky (1995: 97))  
 b. Marie s'étonne {\*de Paul/\*de cette table/du bruit qu'on fait sur cette histoire/(de ce) que Jules soit sorti}.  
 Marie REFL-amazes {of Paul/of this table/of the fuss made about this story/of that Jules left} (ibid.: 98)
- (ii) a. {Èta kniga/Ira/Eë povedenie/Eë postupok} udivljaet Ivana.  
 {this book/Ira/her conduct/her action}-NOM surprises Ivan-ACC  
 b. Ivan udivljaet-sja {\*etoj knige/\*Ire/eë povedeniju/eë postupke}.  
 Ivan-NOM surprise-REFL at {this book/Ira/her conduct/her action}-DAT (ibid.)

He concludes that objects of PT predicates, unlike subjects of EO verbs, must refer to abstract entities in these languages. This clearly suggests that different selectional restrictions are imposed on these two arguments, which is not problematic unless they bear the same semantic relation to the same predicate. However, parallel contrasts are not found in English for some reason, as seen in (28).

*CAUS* in the lowest position within the VP. The structure that he gives to EO constructions is as in (40).



As an argument selected by *CAUS*, the subject in (40) bears the “causer” role, which is a distinct  $\theta$ -role from that borne by the prepositional object of the corresponding PT predicate. Although the latter is an argument selected by the psych root itself, selection of it in the EO construction would result in the structure in (41), where *CAUS* is embedded deeper than every argument selected by the root, because it is an “adjunct” preposition.



Since *CAUS* is also an affixal preposition, it must be affixed to the verbal psych root syntactically in usual cases.<sup>13</sup> This affixation is not possible in (41), however; although the head movement constraint (HMC) forces *CAUS* to first raise to *at* before reaching the psych root, subsequent raising of *CAUS* to V is blocked by virtue of the nonaffixal nature of *at*. On the other hand, if the PP headed by *CAUS* instead projects above *at*,

13 Pesetsky first simply stipulates that the preposition *CAUS* is [+affix], but reformulates its affixal status later in terms of the checking theory. In the later version, the structure involves two instances of *CAUS*, one of which is an affix attached to V in the lexicon, and the other is an independent preposition occupying the same position as it does in (40). The preposition *CAUS* must move to V to check against its higher occurrence in overt syntax because it has certain strong features. This reformulation would not affect the conclusion of our discussion, however.

the theme argument would fail to be selected by the psych root, though the affixation of *CAUS* would be successful.<sup>14</sup> This explains the general impossibility of the occurrence of causers and themes in EO constructions, i.e. the T/SM restriction.

However, questions still remain in Pesetsky's analysis as to how exceptions of the T/SM restriction are accommodated in the general theory of the alternation between EO and PT constructions. The account of these exceptions that he attempts is far from satisfactory, containing several serious problems. In his theory, the T/SM restriction is attributed to the conflict between *CAUS*'s requirement to be affixed and the theme's requirement to be selected by the psych root. This line of reasoning predicts that the restriction disappears in cases where affixation of *CAUS* need not take place in syntax. Pesetsky suggests, therefore, that psych roots are divergent in their need for syntactic affixation of *CAUS*: *CAUS* must be affixed syntactically only if the root has a  $\theta$ -role suppressed by the affix.<sup>15</sup> Since psych roots like  $\sqrt{\text{annoy}}$  are assumed to have their original external  $\theta$ -role "ambient causer (A-causer)" suppressed by *CAUS*, its affixation to them must occur in syntax, as in (40). On the other hand, he argues that syntactic affixation of *CAUS* is not required in the case of verbs of inspiring and discouraging, for example, because their psych roots originally lack A-causers that should be suppressed by the affix, from which the absence of the T/SM restriction in (42) follows.

- (42) a. Sue's remarks aroused us to action.  
 b. The rain discouraged us from our tasks.  
 c. These results inclined us toward the more difficult course.  
 d. Sue's remarks inspired them to action.  
 e. It provoked him to rage.

14 The failure in selection of the theme in this structure follows from the definitions given in (i)–(ii), where relations between predicates and their arguments are regarded not as assignment of  $\theta$ -roles to the latter by the former, but as selection of some property of the latter by the former (" $\theta$ -selection" in Pesetsky's terminology).

(i)  *$\theta$ -selection*

Let  $\tau$  range over (internal, external). If  $\pi$   $\theta$ -selects a  $\tau$   $\theta$ -role R as a lexical requirement, then this requirement is satisfied if either

- a. an argument bearing R occupies a position  $\tau$ -ly selected by  $\pi$  (*direct  $\theta$ -selection*), or  
 b. a  $\theta$ -selector of R heads a position  $\tau$ -ly selected by  $\pi$  (*mediated  $\theta$ -selection*).

(cf. Pesetsky (1995: 183))

(ii) *Selected positions*

- a.  $\pi$  *externally selects*  $\alpha$  iff  $\alpha$  is Spec,  $\pi^{\text{max}}$ .  
 b.  $\pi$  *internally selects*  $\alpha$  iff  
 i.  $\pi$  c-commands  $\alpha$ , and  
 ii. there is no argument category  $\sigma$  such that  $\pi$  c-commands  $\sigma$  and  $\sigma$  c-commands  $\alpha$ .

(cf. *ibid.*: 189)

In the absence of *CAUS*, mediated  $\theta$ -selection of the theme by the root is possible via internal selection of the PP headed by its  $\theta$ -selector *at*. The occurrence of *CAUS* between the root and this PP, however, would exclude the latter from the positions internally selected by the former.

15 The suggested correlation is actually stated in the following form, in accordance with the reformulation mentioned in note 13.

- (i) An affix that suppresses a  $\theta$ -role has strong features. (Pesetsky (1995: 215))

- f. Mary shamed us into going to the movies. (Pesetsky (1995: 216))

This explanation, however, is apparently ad hoc, as Pesetsky himself notes; no independent argument is provided for such a difference in argument structure among the roots of EO verbs. There does not seem to be any principled way to determine whether certain psych roots have A-causers or not. Moreover, other exceptions make the problem much clearer. Since some of verb-particle constructions exemplified in (39) involve EO verbs that may constitute EO constructions without particles, pairs of minimally different sentences are available whose grammaticality depends solely on the presence/absence of particles, as in (43).

- (43) a. \*The check calmed Bill about the accident.  
 b. The check calmed Bill down about the accident. (ibid.: 61)

It seems quite implausible to assume that the same psych root  $\sqrt{calm}$  must take an A-causer in (43a), but need not in (43b).

Furthermore, Pesetsky's explanation of the T/SM restriction is also questionable in relation to binding properties of EO constructions. In his analysis of EO verbs, the existence of *CAUS* in the structure serves to account for not only the T/SM restriction, but also the possibility of backward binding, as seen above. This integration of these two peculiarities of EO verbs, though it appears desirable at first glance, makes incorrect predictions about correlations between them. Crucially, Landau (2004) points out that EO verbs with the agentive reading still obey the T/SM restriction, as in (44), whereas losing most of the characteristic properties of nonagentive EO verbs, including their ability to license backward binding, as in (45).

- (44) a. \*We all tried to satisfy Bill with his trip to Beijing.  
 b. \*Bill maliciously worried Mary about her future.  
 c. \*The weather man deliberately frightens people of another tornado.  
 (Landau (2004: 64))

- (45) a. \*Each other's friends (intentionally) annoy Bill and Mary.  
 (Fujita (1996: 148))  
 b. \*Friends of each other intentionally pleased John and Mary.  
 (Sato (2002: 84))

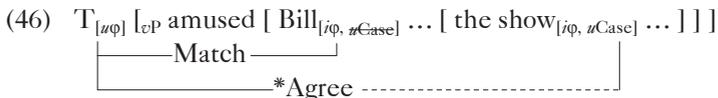
The behavior of agentive EO constructions in these respects is quite problematic for Pesetsky because it would inevitably fail to account for either of the two facts seen in (44) and (45): the structure of agentive EO constructions must involve *CAUS* given the T/SM restriction in (44), but must lack it for the ungrammaticality of (45a, b) to be explained. This suggests that the two properties of EO verbs do not correlate in a way suggested in Pesetsky's analysis.

Finally, let us turn briefly to the object movement approach. Since direct interactions are unavailable in this approach between the subject of EO verbs and the prepositional object of PT predicates, an analysis that adopts it must give an account of the T/SM restriction independent of the occurrence of transitive subjects itself. For example, McGinnis (2000) attributes the restriction to the property of the light head

directly selecting the projection of psych roots: the prepositional argument can only occur when the psych root is selected by a stative, noncausative event head.<sup>16</sup> It cannot appear in EO constructions because it is the causative  $v$  that selects the psych root there. In PT constructions, on the other hand, the psych root is selected by the light head  $a/v$  that is neither eventive nor causative, which allows the occurrence of the prepositional argument. Putting aside the question how nonlocal licensing of prepositional arguments is achieved, however, this does not seem to be a sufficient account; it cannot be anything more than a descriptive generalization until it is explained why the light head in question must be stative and noncausative. In addition, it is again doubtful whether exceptions of the restriction can be prevented in a principled way from being incorrectly ruled out.

#### 2.4. Locality Problems and the Nature of Raising of the Subject/Object

As is clear in the structures in (8) and (9), both movement approaches involve raising of one of the arguments across the other. The assumption of such raising may raise a theoretical problem especially in frameworks that only assume relatively few types of movement in terms of which locality is evaluated. From this perspective, the subject movement approach seems more problematic, because raising of the subject of EO verbs must be an instance of A-movement, as noted in section 2.1. In Chomsky's (2000, 2001) framework, movement of subjects to [Spec, TP] is a concomitant of the establishment of an Agree relation between the former and the head of the latter, namely T. Since it is the  $\phi$ -features on T that serve as the probe in this relation, the intervening experiencer in (8) is predicted to prevent the subject from agreeing with T, as shown in (46).



In (46), the  $\phi$ -features on T must match with those on the experiencer, which is closer to T than the subject, though inactive with its Case feature already valued. The existence of a closer matching goal would rule out an Agree relation between T and the subject, which not only results in the failure of subject raising, but also causes the derivation to crash, leaving the uninterpretable features on them unvalued. The assumption of intermediate landing sites as in Pesetsky (1995) cannot avoid this problem, given that A-movement is always  $\phi$ -feature-driven; the intermediate step across the experiencer would be faced with the same difficulty if it is also induced by  $\phi$ -features.

The object movement approach, on the other hand, allows a wider range of

16 Although McGinnis herself do not adopt either of the movement approaches, her explanation of the T/SM restriction is readily available in the object movement approach, because she assumes for EO verbs a base structure in which the subject is generated above the experiencer.

possibilities as the motivation for covert raising of the object of EO verbs, because it can be assumed to take place after the experiencer object completes its A-chain. It is not easy, however, to identify the feature triggering it. As seen in 2.2.1, it cannot be quantificational A'-movement, and the moved object must be interpreted in its landing site. While the first property suggests that it has a nature similar to topic movement, the second property entails that its application is obligatory. Then, the triggering feature necessarily coincides with a Q-feature when the experiencer is a *wh*-phrase, as in (47).

- (47) a. Who does everything worry? (Landau (2004: 100))  
 b. Which kid is every puppet scaring? (ibid.: 102)

It seems quite questionable whether the same DP can be both a topic and *wh*-phrase.

### 3. The Structure of EO and PT Constructions

In this section, I present an alternative analysis of EO constructions along with several proposals about their special properties on the basis of the above discussion. Before turning to my analysis, I further observe a fact that gives a clue to the nature of EO constructions. This observation particularly concerns the hidden character of the subject of EO verbs, and reveals that a certain subtype in fact constitutes the most typical set of these constructions.

#### 3.1. EO Verbs with *Tough* Movement and Clausal Subjects

Pesetsky (1987) makes an interesting and significant observation on the properties of EO verbs: they can form constructions closely similar to *tough* constructions, accompanied by an infinitive with an object gap, as in (48).

- (48) a. These pictures<sub>i</sub> annoy me<sub>j</sub> [PRO<sub>j</sub> to have to look *e*<sub>i</sub>].  
 b. Those stories<sub>i</sub> pleased me<sub>j</sub> [PRO<sub>j</sub> to listen to *e*<sub>i</sub>].  
 c. John's health<sub>i</sub> worries me<sub>j</sub> [PRO<sub>j</sub> to talk about *e*<sub>i</sub>].  
 d. War<sub>i</sub> frightens me<sub>j</sub> [PRO<sub>j</sub> to think about *e*<sub>i</sub>]. (Pesetsky (1987: 128))

This is obviously a characteristic property of EO verbs; non-psych verbs do not allow parallel constructions, as demonstrated in (49).

- (49) a. \*Bill<sub>i</sub> kicked me<sub>j</sub> [PRO<sub>j</sub> to have to look at *e*<sub>i</sub>].  
 b. \*Those dogs<sub>i</sub> bit me<sub>j</sub> [PRO<sub>j</sub> to give water to *e*<sub>i</sub>].  
 c. \*Mary<sub>i</sub> sued Sue<sub>j</sub> [PRO<sub>j</sub> to prove a point to *e*<sub>i</sub>]. (ibid.)

As is well known, *tough*-adjectives display a systematic alternation between *tough* constructions and constructions with (often extraposed) gapless infinitival subjects (henceforth non-*tough* constructions), as illustrated by the contrast between (50) and (51).

- (50) Linguists are tough to please. (Hicks (2009: 535))  
 (51) a. It is tough to please linguists.  
 b. To please linguists is tough. (ibid.: 536)

From the perspective of this alternation, it turns out that EO construction with *tough* movement also has their “non-*tough*” counterparts; EO constructions with clausal subjects can be regarded as corresponding constructions without *tough* movement. Clausal subjects can be either extraposed or intraposed, as in (52) and (53), respectively.

- (52) a. It embarrasses you [PRO to see her naked].  
 b. It grieved me [PRO to leave you like that]. (Cornilescu (2003: 289))  
 c. It pleased Bill to win the election. (Martin (2001: 149))  
 (53) a. [PRO to see her naked] embarrasses you. (Cornilescu (2003: 289))  
 b. [PRO To realize that the light are on] always bothers Bill.  
 (Pesetsky (1991: 91))  
 c. [PRO to know French well] would please John. (ibid.: 92)

The interpretation of the clausal subjects in (52)–(53), just as nominal subjects, indeed fall under the rubric of the “causer” of the verb, but a closer look reveals that they vary to some extent in factivity and contribution to the interpretation of the sentence, which provides an important clue to the nature of the semantics of EO constructions. In the examples in (52a) and (53), in which the matrix clauses involve modal or generic quantifications, the clausal subjects have the irrealis reading, interpreted to specify the “condition” on which the experiencer is in the psychological state denoted by the psych root, whereas in (52b, c), in which the matrix tense is past, the clausal subjects have the realis reading and is interpreted as describing the “cause” of the experiencer psychological state.

This situation is strikingly similar to the case of class W adjectives (CWAs), whose clausal subject may also have the irrealis or realis reading depending on the matrix tense, as illustrated by the contrast between (54a, b) and (54c).

- (54) a. It is stupid to give up in such a situation.  
 b. It would be stupid to give up in such a situation.  
 c. It was stupid to give up in such a situation. (Geuder (2000: 166))

Maezawa (2009) argues that the clausal argument of CWAs is semantically not associated with the predicate root by any sort of predicate-argument relation, and hence must receive an interpretation by serving as the restrictor of a modal/generic operator or an  $\iota$ -operator on the matrix T, which binds variables of the semantic type “state of affairs.” Here I call this kind of variables “tense” variables, taking them as corresponding to the syntactic conception of tense. Consequently, the irrealis and realis readings of the clausal argument of CWAs immediately follow from the semantics of the modal/generic and  $\iota$ -operators, respectively. The examples in (54b) and (54c) are, for example, given the semantic representations such in (55a) and (55b), where the tense variable  $\tau$  is bound by the modal or  $\iota$ -operator.

- (55) a. would $\tau$ [to-give-up-in-such-a-situation( $\tau$ )]  $\exists x$ [stupid( $\tau$ , x)]  
 b.  $\iota\tau$ [to-give-up-in-such-a-situation( $\tau$ )]  $\lambda\sigma$ [ $\exists x$ [stupid( $\sigma$ , x)]]

Likewise, the subjects in (52a) and (53) are naturally taken as serving as restrictors of the respective operators. In a parallel way to the case of CWAs, the EO constructions in (53c) and (52c) can, for example, be given the semantic representations roughly depicted in (56a) and (56b), respectively.

- (56) a. would $\tau$ [to-know-French-well( $\tau$ )] [ $\sqrt{\text{please}}(\tau$ , John)]  
 “In the situation in which someone knows French well, John would be pleased.”  
 b.  $\iota$ [to-win-the-election( $\tau$ )]  $\lambda\sigma$ [ $\sqrt{\text{please}}(\sigma$ , Bill)]  
 “The situation in which Bill win the election is a situation in which Bill is pleased”

Based on this discussion, next I will make a number of proposals on EO verbs and EO constructions.

### 3.2. Proposals

To provide an adequate analysis of the structure and the derivation of EO constructions and the corresponding PT predicates, I first make several proposals about their properties, as listed in (57).

- (57) a. The roots of psych predicates ( $\sqrt{\Psi}$ s) are invariably monadic, but can be either SLPs or ILPs with the argument structure  $\langle e \rangle$  or  $\langle \tau \rangle$ , respectively.  
 b.  $\sqrt{\Psi}$ s can select a non-thematic complement; it does not contribute to the saturation of the argument structure of the predicate root in any form.  
 c.  $\sqrt{\Psi}$ s are selected by the non-agentive light verb  $v_{NA}$  or by the possessive light adjective  $a_{\text{Poss}}$ , which results in EO verbs and PT predicates, respectively.  
 i.  $v_{NA}$  bears a tense variable and selects a non-thematic external arguments as its specifier.  
 ii.  $a_{\text{Poss}}$  also bears a tense variable and a possessor as its specifier.  
 d. There is a null counterpart of the preposition *of*, which I refer to as  $\emptyset_{of}$ . Unlike *of*, however,  $\emptyset_{of}$  has no Case-assigning property.

Based on the observation of periphrastic constructions involving nouns denoting emotions, Bouchard (1995) argues that the argument structure of EO verbs consists of Trigger (Causer), Experiencer and “Psy-chose,” which refers to a psychological object like an emotion, only found in mental space. (57a) claims that  $\sqrt{\Psi}$ s only refer to this kind of psychological objects, stripped of the other arguments that participate in psych constructions. Also I assume these psychological objects to be ambiguous between (a kind of) events and tenses.

The proposals in (57b, c) are crucial for the analysis made here. They have much to do with the puzzling behavior of EO verbs and their subject as well as the alternation

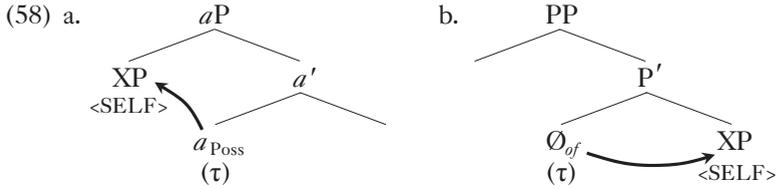
between EO and PT constructions. Both in (57b) and (57c), the “non-thematic” is intended as the absence of a thematic relation to the predicate root; arguments of  $\sqrt{\Psi}$ s are generated with the same syntactic status as normal arguments, and some selectional restrictions are imposed on them, and nonetheless they do not enter any predicate-argument relation with the predicate at the semantic interface. Hence they must be licensed by some other means.

(57d) plays a significant role in accounting for the T/SM restriction.

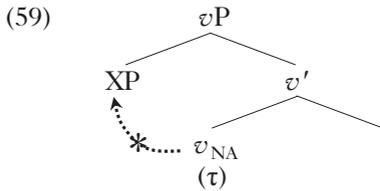
This section, as preliminaries to the analysis, also contains a series of proposals about a syntactic implementation of the conception of logophoricity. In some contexts such as those of backward/long-distance binding or picture nouns, it has often been argued that reflexives and reciprocals without local antecedents serve as logophors rather than anaphors, and a number of studies put forward accounts of their behavior with recourse to logophoricity. While most syntactic analyses of reflexives/reciprocals, including Reinhart and Reuland (1993), take the view that syntax only determines what serves as a logophor and the determination of its referent falls out of syntax, probably belonging to pragmatics or discourse grammar, there have been some attempts made to deal with it in syntax on the assumption that discourse/pragmatic factors are also represented in the syntactic structure (See Speas (2004), among others). In this sense, this is another attempt at a syntactic approach to logophoricity with a different implementation. More specifically, I take logophoricity as the notion related with the semantic type of state of affairs, which, as noted above, I assume correspond to the syntactic conception of tense.

The antecedent of a logophor has been characterized in several ways, for example, “the center of consciousness, defining point of view, or perspective holders” (Reuland (2005)), or the one “whose speech, thoughts, feelings, or general state of consciousness are reported” (Clements (1975)). Developing such rather general definitions, Sells (1987) further distinguishes three “logophoric roles” borne by the antecedent of a logophor: the SOURCE, SELF and PIVOT, which are understood as the one who makes the report (as the speaker), the one whose “mind” is being reported, and the one from whose point of view the report is made in a physical sense, serving as the “center of deixis,” respectively (Sells 1987, f. 455). As is clear from Sells’ characterizations, the properties needed to serve as the antecedent of a logophor have been captured in connection with certain kinds of propositional contents and predicates selecting them.

On the basis of this understanding, I propose that certain (functional) categories bear a tense variable and assign their arguments a certain logophoric role, taking state of affairs as extents that some human/sentient being is (potentially) conscious of or takes cognizance of. In other words, some categories are predicates of tenses that describe their relation to their (necessarily animate) “observer,” whose existence is ensured by definition. The light adjective  $a_{\text{Poss}}$  in (57cii) is an instance of such predicates; it selects as its specifier the SELF of a tense, namely a state of affairs that it is predicated of, as schematized in (58a). Another instance of this kind of predicates is  $\emptyset_{\text{of}}$  mentioned in (57d).  $\emptyset_{\text{of}}$  also bears tense variable and selects its SELF but as a complement, as in (58b).



In addition, I further propose the existence of their “unaccusative” counterparts, i.e. predicates with the argument structure that only contains a tense variable. The unaccusative type of tense predicates is exemplified by  $v_{NA}$  in (57ci). As stated there, the term “unaccusative” here does not necessarily imply the lack of (the ability to take) a specifier; it just means that the predicate does not assign its specifier either logophoric roles or  $\theta$ -roles in the usual sense, as illustrated in (59).



For convenience of exposition, I call predicates of the types instantiated in (58a), (58b) and (59) as “transitive,” “locative” and “unaccusative” logophoric predicates.

Basically, I assume that transitive and locative logophoric predicates have the semantics of *have* in quite a broad sense. Tenses are taken cognizance of by their SOURCE/SELF/PIVOT and the entities contained in them are “possessed” in some sense. If transitive logophoric predicates take as their complement an individual, event, or entity of any other semantic type except tense, their specifier “has” it. Following Kratzer (1996), on the other hand, I assume the application of  $\theta$ -identification if they take a predicate of tenses as their complement. The same holds for unaccusative logophoric predicates, but they take no other arguments even implicitly, though the existence of the SOURCE/SELF/PIVOT per se is entailed.

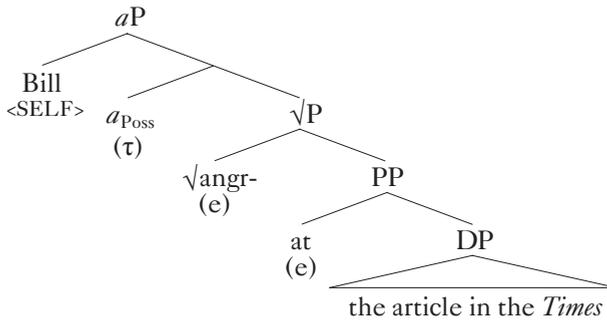
Given the set of the above proposals, I first present the structures of PT constructions and EO constructions with clausal subjects

### 3.3. The Structure of PT Constructions and EO Constructions with Clausal Subjects

Let us begin with the structure of PT constructions. The structure assumed for the example in (3a) is given in (60).

(3) a. Bill was angry at the article in the *Times*.

(60)

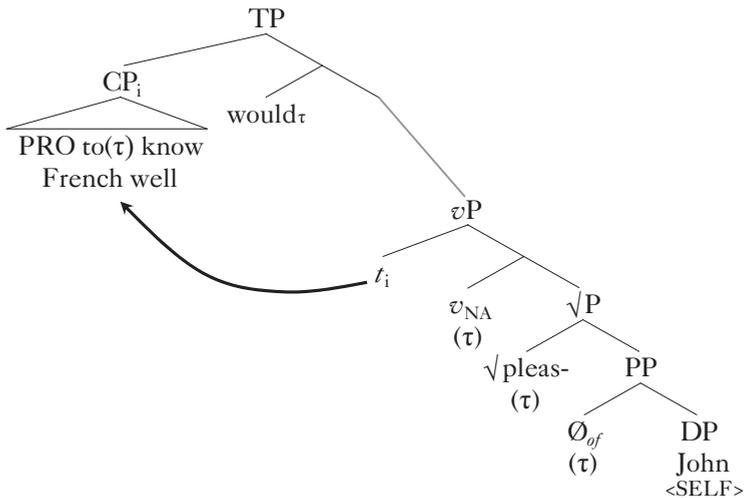


In (60),  $\sqrt{\text{angr-}}$  selecting a non-thematic complement is in turn selected by *a*<sub>POSS</sub>, whose specifier is interpreted as the Experiencer, assigned the logophoric role SELF. The non-thematically selected PP, along with  $\sqrt{\text{angr-}}$ , undergoes the application of existential closure, with the result semantically equivalent to the predication/modification of the latter by the former.

Turn next to the structure of EO constructions with clausal subjects. The example in (53c) can be assigned the structure in (61).

(53) c. [PRO to know French well] would please John.

(61)



In (61),  $\sqrt{\text{pleas-}}$  selects the PP headed by  $\emptyset_{of}$  as non-thematic complement, which results in the interpretation in which the SELF of the state of affairs  $\sqrt{\text{pleas-}}$  is predicated of is *John* by binding of the tense variables  $\sqrt{\text{pleas-}}$  and  $\emptyset_{of}$  bear by the same modal operator *would*. Consequently, *John* and *Bill* are both interpreted as the Experiencers in the PT construction in (3) and the EO construction in (53c).

$\sqrt{P}$  is then selected by *v*<sub>NA</sub>, which selects an infinitival clause, namely "Causer," as its specifier despite the fact that the former assign the latter no logophoric/θ-role. This forces the clause to be integrated into the semantics of the sentence by establishing a relation to some other element. This is achieved by its raising to the

subject position under Diesing’s (1992) Mapping Hypothesis:<sup>17</sup>

(62) *Mapping Hypothesis*

Material from VP is mapped into the nuclear scope.

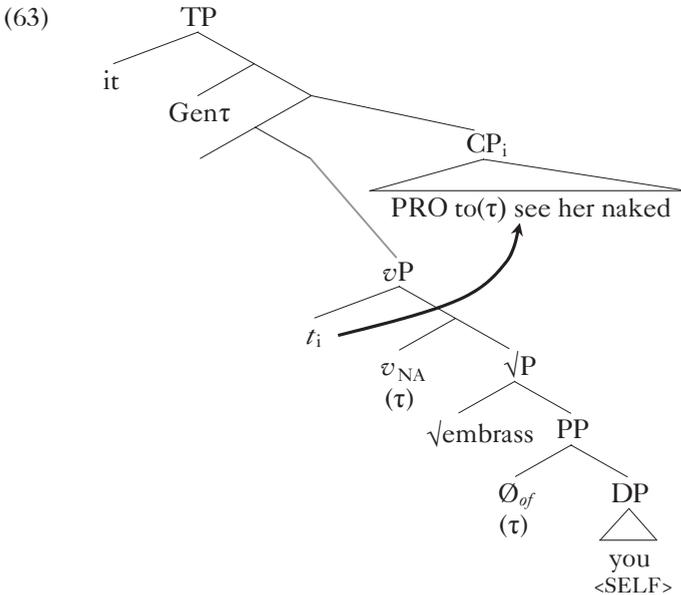
Material from IP is mapped into a restrictive clause. (Diesing (1992: 10))

The subject in (53c) reaches the IP domain and mapped into a restrictive clause of *would* at the semantic interface, successfully assigned an adequate interpretation.

Note here that the assignment of the logophoric role SELF to *John* also has an effect on the interpretation of the clausal subject. The tense variable contained in the clausal subject is bound by the same operator that binds that borne by  $\emptyset_{of}$ , which entails that the SELF of the clausal subject is also John.

The subject of (53c) is intraposed, namely has raised to the subject position, as in the case of nominal subjects. Then, what about EO constructions with extraposed clausal subjects? The derivation of (52a), for example, is assumed as shown in (63).

(52) a. It embarrasses you [PRO to see her naked].



The internal syntax of *vP* in (63) is exactly the same as that in (62), involving the non-thematic selection of PP and CP by  $\sqrt{\Psi}$  and  $v_{NA}$ , respectively. In this case, however, it is the application of extraposition rather than raising to the subject position that saves the derivation by linking the clausal subject to the operator, which integrates the former into the semantics of the sentence appropriately.

Given the base structures and the derivations of EO constructions in (61) and (63), let us return to the derivation of their *tough* counterparts, i.e. EO constructions

17 Recast in more recent assumptions on the clause structure, “VP” and “IP” in (62) should be understood as referring to the VP and IP domains, respectively.

with nominal subjects.

### 3.4. The Structure of EO Constructions with Nominal Subjects and Concealed Clauses

Observing the fact that EO verbs can involve tough movement, as in (48), Pesetsky (1987) notes that infinitival clauses in such examples can be deleted. If so, the possibility of such deletion, as often assumed for *tough* constructions, would be formulated on the basis of recoverability. On this assumption, The underlying structure of (3b) would be something like (64a), to which deletion applies, as shown in (64b).

- (3) b. The article in the *Times* angered Bill.  
 (64) a. The article<sub>i</sub> in the *Times* angered Bill<sub>j</sub> [PRO<sub>j</sub> to {read/write} e<sub>i</sub>].  
 b. The article<sub>i</sub> in the *Times* angered Bill<sub>j</sub> [~~PRO<sub>j</sub> to {read/write} e<sub>i</sub>~~].

This analysis, however, seems to have some difficulty; EO verbs generally allow various possibilities with respect to the Experiencer's concern about the Causer compared to what is predictable from recoverability. In the case of examples like (65), for example, it is not clear what kind of predicates are regarded as recoverable due to the diversity of conceivable concerns about the television set.

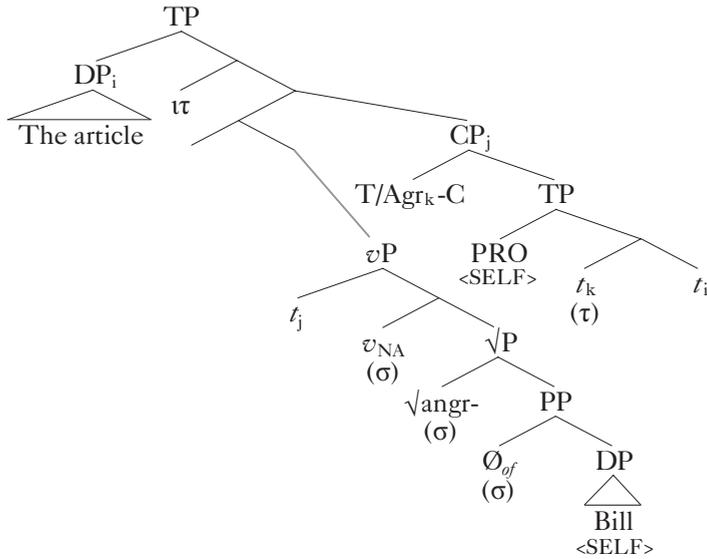
- (65) The television set worried John. (Pesetsky (1995: 57))

Therefore I take a slightly different approach here. Larson et al. (1997) provide an intriguing analysis of complements of intensional transitive verbs including EO verbs. They claim that intensional transitive verbs usually select clausal complements even when they appear to take nominal objects, by assuming concealed clause structure involving nonovert verbs like HAVE. Instead of assuming full clause structures, here I make the following assumptions to make an analysis of EO constructions with nominal subjects:

- (66) a. T/Agr is a logophoric predicate either transitive or unaccusative.  
 b.  $v_{NA}$  selects "transitive" T/Agr.  
 c. T/Agr can select PRO and a DP as its specifier and complement, respectively.  
 d. The DP selected by T/Agr undergoes "tough movement," surfacing in the matrix subject position.  
 e. "Transitive" T/Agr undergoes extraposition, as in (63).

Given this set of assumptions, let us first consider the derivation of the typical example of (3b). The structure and derivation of (3b) is roughly schematized as in (67).

(67)



After the completion of  $vP$  as in (61) and (63), the DP embedded in the Causer CP raises to the matrix subject position, while the remnant CP is extraposed to the IP domain to be mapped into a restrictive clause. Given the copy theory of movement, the nominal subject can reconstruct, i.e., its base copy can be interpreted at the semantic interface. Accordingly, the semantic representation of (3b) is as in (68).

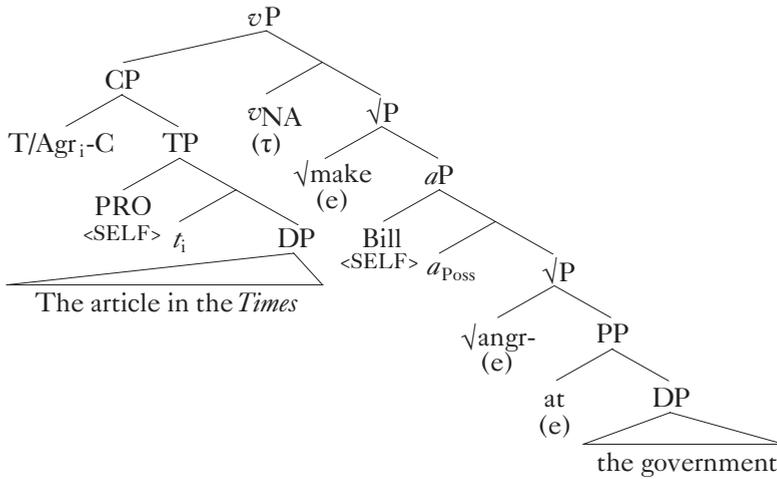
(68)  $\iota$ [PRO HAVE( $\tau$ ) the article in the *Times*]  
 $\lambda\sigma$ [BE( $\sigma$ ) &  $\sqrt{\text{angr-}}$ ( $\sigma$ ) & Bill HAVE( $\sigma$ )]

Here, the logophoric predicate HAVE denotes the have-relation in a broad sense, as noted above; the SELF Bill is conscious of the relevant state of affairs and entities contained in it.

Periphrastic psych constructions are also derived in basically the same way. The example in (31a), for example, has also a structure involving  $v_{NA}$ , which selects the root of the matrix predicate *make* in this case. The only major difference is that the embedded  $\sqrt{\Psi}$  is selected by  $a_{\text{POSS}}$  rather than selecting non-thematic PP to introduce the Experiencer. Consequently, the internal structure of  $vP$  in (31a) is as in (69).

(31) a. The article in the *Times* made Bill angry at the government.

(69)



#### 4. Explaining the Peculiar Properties

In this section, I provide an account of the peculiar properties of EO constructions observed in section 2. The structures and the derivation of EO and PT constructions seen in the previous section have already revealed the nature of these puzzling properties. As a result, they are accounted for quite straightforwardly.

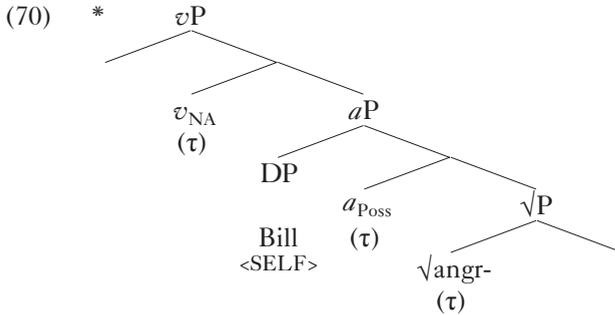
##### 4.1. Backward Binding

In the present analysis, EO constructions and periphrastic constructions with a similar semantics share two crucial properties in connection with backward binding: the presence of a logophoric predicate that assign the role SELF, and the presence of  $v_{NA}$ , which selects non-thematic (concealed) clausal subjects with the transitive logophoric T/Agr. The possibility of backward binding naturally follows from these properties. As noted above, the tense variables borne by the predicates selecting the Experiencer and the T/Agr in the clausal subject. Since the PRO selected by the latter is also assigned the role SELF, the coreference of the Experiencer and PRO is available, which provides the subject DP with a local antecedent virtually identical to the Experiencer. In other words, the backward character of the anaphor binding in question is only superficial.

##### 4.2. The T/SM Restriction

The T/SM restriction is basically attributed to two major factors: (i) the unavailability of  $a_{Poss}$  or other transitive logophoric predicates in EO constructions, and (ii) the uninterpretable  $\phi$ -features on  $v_{NA}$  with the accusative Case-assigning property. The first factor is further attributed to morphological reasons. Unlike periphrastic

constructions like (69), the structure in (70), where  $v_{NA}$  directly select the functional projection headed by  $a_{Poss}$ , causes problems for some morphological operation.



Hence the only way to introduce the Experiencer into the structure is to merge it as the complement of  $\emptyset_{of}$  non-thematically selected by  $\sqrt{angr-}$ . This excludes the possibility of the occurrence of the Target/SM, because it competes with the Experiencer for the complement position of  $\sqrt{angr-}$ . The absence of the Experiencer is also ruled out by the second factor. Since  $\emptyset_{of}$  has no Case-assigning property, the Experiencer in EO constructions remains active and hence can enter into an Agree relation with  $v_{NA}$ . The Target/SM, on the other hand, has agreed with the preposition and been rendered inactive at the stage of the derivation where  $v_{NA}$  is introduced, which causes the derivation to crash due to the unvalued  $\phi$ -features on  $v_{NA}$ .

## 5. Conclusion

In this paper, I explored the structure of EO verbs in particular in connection with that of the corresponding PT predicates. A detailed examination of previous studies and the data provided by them revealed a number of peculiar properties of EO constructions. Among them, I focused on two major peculiarities, namely the possibility of backward binding and the Target/SM restriction. I attempted a different approach from previous analyses by making a series of proposals, which make possible an alternative structural analysis of EO and PT construction. The two peculiar properties were accounted for straightforwardly under the proposed analysis.

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