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Author(s)	Honda, Takahiro
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Osaka University

TAKAHIRO HONDA

ON THE PASSIVIZABILITY OF PERCEPTION AND CAUSATIVE VERBS*

1 INTRODUCTION

In this paper, I will discuss the long-standing riddle of why perception and causative verbs cannot be passivized, even though they seem to be transitive verbs. These verbs are known to take bare infinitives for complements in the active voice, as in (1).

(1) a. John saw her leave.
b. John made her run.

The accusative morphology in (1) indicates that the matrix verbs assign accusative Case to the embedded subjects. However, in contrast to ECM verbs, as in (2), the passive counterpart to (1) is unacceptable, as illustrated in (3).

(2) a. John believes her to win the race.
b. She is believed to win the race.
(3) a. *She was seen leave.
b. *She was made run.

On the other hand, it has been assumed that the acceptable passive counterpart takes *to*-infinitives as complements, as shown in (4).

(4) a. She was seen to leave.

* This paper is a revised version of Chapter 5 of Honda (2012), and earlier versions of this study were presented at the 35th Annual Meeting of the Kansai Linguistic Society, held at Kyoto University of Foreign Studies in June 2010, and were subsequently published as Honda (2011). I am indebted to Yukio Oba, Sadayuki Okada, Koji Fujita, and the audience at the meeting for their invaluable comments and suggestions. I also would like to thank the informants at the University of Connecticut for judging my English data, and I am grateful to Koji Shimamura for asking them. Needless to say, all remaining inadequacies are mine.

b. She was made to run.

Yet, there is no active counterpart to (4).

(5) a. *John saw her to leave.
b. *John made her to run.

Therefore, the behavior of perception and causative verbs seems quite mysterious. If the matrix verbs assign accusative Case to the embedded subjects in the same way ECM verbs do, we cannot account for why the embedded subjects cannot be passivized, as in (3). On the other hand, given that sentences like (4) are acceptable passive sentences, we do not understand why there is no active counterpart like (5).

The aim of this paper is to clarify the reason why it is impossible to derive sentences like (3). Additionally, I discuss sentences like (4).

The organization of this paper is as follows. In section 2, I review three major previous analyses, Hornstein et al. (2008), Felser (1998), and Basilico (2003). The first one assumes that both (1) and (4) are derived from the same base structure, while the others argue that there is no active-passive relation between these two sentences. I discuss these three approaches and point out some of their problems. In section 3, I propose the syntactic structure for (1), which is based on Basilico's (2003) analysis. Section 4 discusses the derivation of sentences like (4). I propose that sentences like (4) have the similar structure as sentences with *wager*-class verbs. Section 5 presents the conclusion of this paper.

2 Previous Analyses

2.1. Review of Hornstein et al. (2008)

Hornstein et al. (2008) argue that the complement of perception verbs is TP, adopting Chomsky's (2001) maximization principle that claims partial elimination of features under Match, followed by elimination of the residue under more remote Match, is not an option.

First, they distinguish (6a)/(7b), on the one hand, and (8b)/(9b), on the other.

(6) a. John saw/heard/made them hit Fred.
b. *John saw/heard/made them to hit Fred.
(7) a. *They were seen/heard/made hit Fred.
b. They were seen/heard/made to hit Fred.
(Hornstein et al. 2008: 198)
(8) a. *I saw John know French.

b. John was seen to know French.

(9) a. *I heard John have an accent.
b. John was heard to have an accent. (Hornstein et al. 2008: 200)

According to their analysis, perception verbs (and causative verbs) select eventive predicates as complements. For this reason, (8a) and (9a) are unacceptable because the complements are propositions. On the other hand, their passive counterparts are acceptable, as in (8b) and (9b). They claim that these sentences have an epistemic reading that can be paraphrased roughly as in (10).

(10) a. It was known that John knew French.
b. It was known that John had an accent. (ibid.: 200)

Given that the eventive reading is associated with TP, i.e. a bare infinitive, while the propositional/epistemic reading is associated with CP, i.e. *to*-infinitival, the complements in (8b) and (9b) are CPs. This indicates that (6a) and (7b) have a different structure from (8b) and (9b). Accordingly, the active counterparts to (8b) and (9b) actually correspond to (11a) and (11b), respectively.

(11) a. *I saw John to know French.
b. *I heard John to have an accent.(ibid.: 201)

Hornstein et al. argue that the contrast between (11a) and (8b) or between (11b) and (9b) can be reduced to that between (12a) and (12b).

(12) a. *John wagered Peter to be crazy.
b. Peter was wagered to be crazy. (ibid.)

Wager-class verbs take propositions as complements and allow the passivization of embedded subjects even though they cannot assign Case to these subjects in the active. The ungrammaticality of (11) and (12a) is attributed to the Case-assigning ability of the verbs. Therefore, we can conclude that (8) and (9) are not examples of perception verbs, as in (6) and (7).

Hornstein et al. then assume that both infinitives and past participles are "nominal" projections in the sense that they are associated with Case and φ-features. They argue that the infinitival complement of perception and causative verbs in English is inflected in number and Case, given Raposo's (1987) observation that Portuguese infinitival clauses can only appear in positions where Case can be licensed, as in (13).

(13) a. O rapaz receia [chumbar o exame].
the boy fears fail-Infl the exam

'The boy fears failing the exam.'

b. o receio *(de) [chumbar o exame]
the fear of fail-Infl the exam
'the fear of failing the exam'

c. O rapaz está receoso *(de) [chumbar o exame].
the boy is fearful of fail-Infl the exam
'The boy is fearful of failing the exam.'

(Hornstein et al. 2008: 203–204)

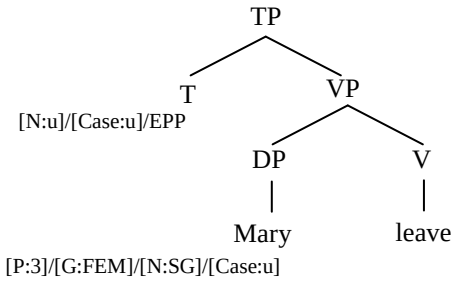
Infinitival clauses can be Case-marked when they are the complements of verbs, as in (13a). In contrast, when they appear as the complements of nouns or adjectives as in (13b) or (13c), the insertion of the dummy preposition *de* 'of' is required for Case-marking. This shows that infinitival clauses in Portuguese must be assigned Case.

Hornstein et al. suggest that the same analysis can be applied to English infinitival clauses, which also require Case assignment.[1] In addition, they assume that the infinitival T has an uninterpretable Case feature and a set of φ-features, which are necessary for its Case valuation under φ-checking. Considering that the infinitival T cannot assign Case to the embedded subject, they also assume that the φ-set of the infinitival T involves only number, which is [−interpretable].[2]

Accordingly, the derivation of the infinitival complement of (14) is (15).

(14) I saw Mary leave.

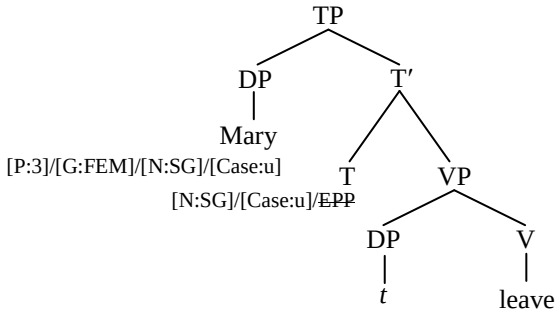
(15) a.



[1] The analysis in Hornstein et al. takes into account that before the phonological weakening of the infinitive's inflectional endings, English also had an overt infinitival morpheme.

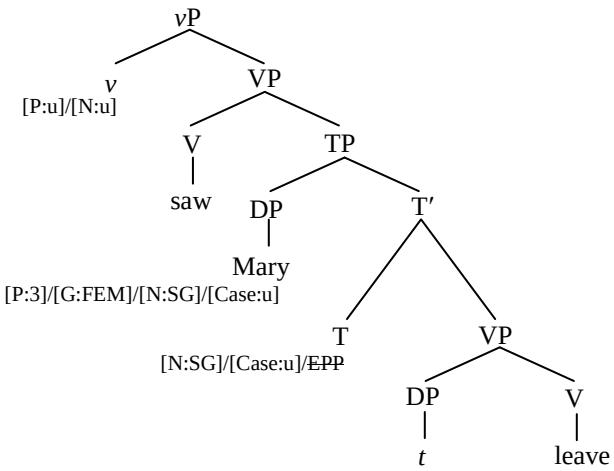
[2] Hornstein et al. argue that there is no evidence that a gender feature may be associated with T in either European Portuguese or English, and that if the infinitival T had a person feature, it could value the Case feature of the embedded subject under Chomsky's (2000, 2001) system.

b.



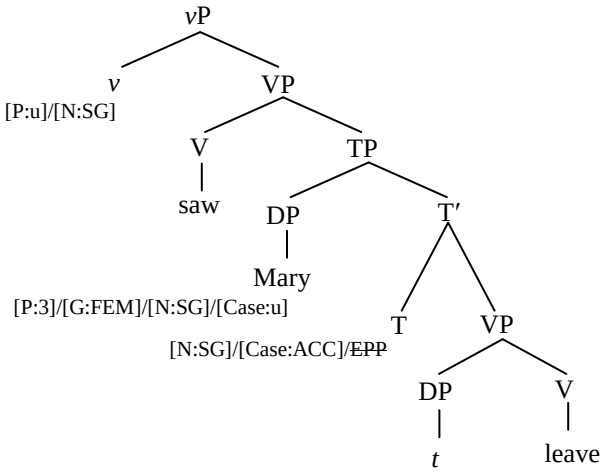
As we see in (15b), the infinitival T agrees with the embedded subject *Mary*, which values the number feature of the infinitival T and satisfies the EPP. The infinitival T cannot assign Case to Mary because the infinitival T does not have a [−interpretable] person feature. Then, the light verb *v* is merged as in (16).

(16)



In (16), the infinitival T and the embedded subject *Mary* are equidistant from the light verb *v*, which indicates that either element can agree with *v*. If the light verb *v* agrees with *Mary* first, the number feature and the person feature of *v* are both valued. Then, T cannot agree with *v*, since *v* has no unvalued feature under the maximization principle. As a result, the Case feature of T remains unvalued, which causes the derivation to crash. Alternatively, if *v* agrees with the infinitival T first, the Case feature of T is valued with the person feature of *v* unvalued, as in (17).

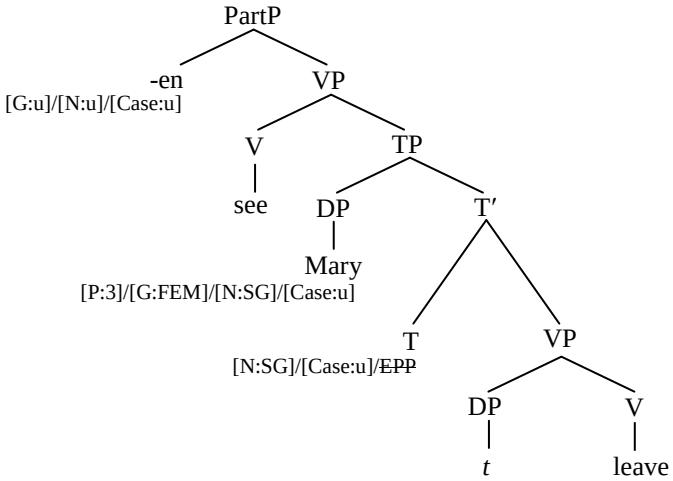
(17)



In (17), *v* remains active and then agrees with *Mary*, which values the person feature of *v* and the Case feature of *Mary*. Consequently, all the features in the derivation are valued, and the derivation converges.

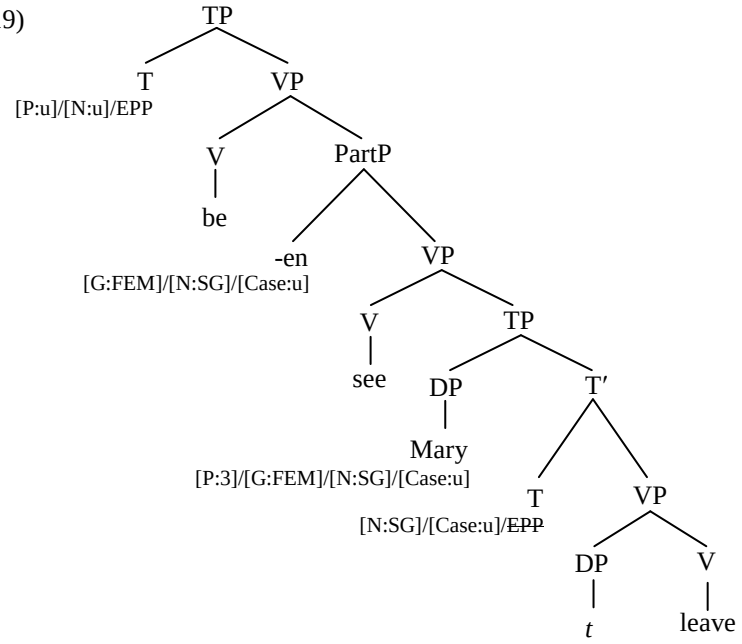
Next, let us consider the passive counterpart. Hornstein et al. assume that passive sentences are derived when VP is selected by the participial head *-en* instead of the light verb *v*. They argue that the participial head has unvalued gender, number, and Case features. Accordingly, the passive of a perception verb has the following structure:

(18)



In (18), agreement between the participial head *-en* and the embedded subject *Mary* values the gender and number features of *-en*. Further computations then introduce a finite T into the structure, which can value Case features, as shown below:

(19)



There are three elements that have an unvalued Case feature in (19); the participial head *-en*, the infinitival T and the embedded subject *Mary*. These three elements must agree with the finite T in order to value the unvalued Case feature. Note that *-en* and the infinitival T are not equidistant from the finite T. It is *-en* that is closer to the finite T. Compared with *-en*, the infinitival T has fewer features that can agree with the finite T. The participial head *-en* has the gender feature, the number feature and the Case feature, while the infinitival T lacks the gender feature. On the other hand, the embedded subject has the person feature in addition to the features that *-en* has. Under the maximization principle, *-en* does not intervene between the finite T and the embedded subject *Mary*. Therefore, the finite T agrees with *-en* first and then agrees with *Mary*. However, *-en* does intervene between the finite T and the infinitival T. As a result, the Case feature of the infinitival T remains unvalued, which is why a passive sentence like (20) is not grammatical.

(20) *Mary was seen leave.

Now, let us consider how the grammatical passive of perception verbs like (21) is derived.

(21) Mary was seen to leave.

It is a mystery why *to* is inserted in (21). According to Hornstein et al., this

to-insertion process is reminiscent of the *of*-insertion rule, as shown in (22).

(22) a. *the destruction the city
b. the destruction of the city

The preposition *of* in (22b) is the morphological realization of the inherent Case assigned by the nominal *destruction* to its complement (Chomsky 1986). This *of*-insertion rule is known as a Last Resort repair strategy to circumvent the Case Filter violation. Hornstein et al. claim that the preposition *to* in (21) is the realization of the inherent Case assigned by the matrix verb to its infinitival complement.

Furthermore, they argue that perception verbs can assign the inherent Case either in the active or the passive, but the economy principle excludes sentences like (23) because the *to*-insertion is a Last Resort strategy.

(23) *I saw Mary to leave.

2.2. Examination of Hornstein et al. (2008)

Hornstein et al. elegantly explain the grammaticality of the active-passive pair of perception verbs, but their analysis holds some empirical problems.

Their analysis emerges from the notion that both the active and passive of perception verbs are derived from the same base structure. If this analysis were correct, we could not predict the fact that agentive perception verbs like *watch*, which also take bare infinitival complements, do not passivize, as shown in (24).

(24) a. We watched John draw a circle.
b. *John was watched (to) draw a circle. (Felser 1999: 31)

Even if they assume another structure for this class of verbs, there remains another problem with this analysis. Perception verbs can be followed by clausal idioms, as illustrated below:

(25) a. I saw the shit hit the fan. (Ushie 1995: 294)
b. *The shit was seen to hit the fan. (ibid.: 301)

However, as we see in (25b), clausal idioms cannot appear in passive forms of perception verbs. If both sentences in (25) are derived from the same base structure, the unacceptability of (25b) is mysterious.

Considering these facts, we can conclude that the active and passive forms of

perception and causative verbs must be derived from different structures, contrary to the analysis presented in Hornstein et al. (2008).

2.3. Review of Felser (1998)

Felser (1998) considers why the complement of perception verbs lacks some of the projections illustrated in (26), which is the basic structure of a full English sentence in the early Minimalist Program framework.

(26) $[_{CP}$ C $[_{AgrSP}$ AgrS $[_{TP}$ T $[_{AgrOP}$ AgrO $[_{VP}$ … V …]]]]]

First, Felser argues that at least AgrO is projected above VP in the complement of a perception verb that contains a transitive verb; otherwise, the object in the embedded clause could not be checked its Case. Moreover, she assumes that the verb in the embedded clause is raised to a head higher than AgrO, taking up (27) as an example.

(27) a. We saw Mikey look(ing) the reference up.
b. We heard Betsy throw(ing) the bicycle out. (Felser 1998: 357)

According to Johnson (1991), the verb and its particle become separated when the verb moves to some higher head position, leaving the particle behind. In addition, as Guasti's (1993) floating quantifier example in (28) shows, the object of the embedded clause is overtly raised to SPEC-AgrO.[3]

(28) I saw the children all leave.

Since the direct objects in the embedded clauses are overtly raised to SPEC-AgrO, the verbs *look* and *throw* must be raised to a higher head than AgrO in (27).

Second, Felser points out that perception complements are not specified for tense. These complements do not permit aspectual *have* or stative predicates, as in (29)

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[3] As Basilico (2003) points out, the appearance of floating quantifiers is not always evidence of movement. The following examples are cases in point:

(i) a. *The children were seen all.
b. *The ice cubes froze all.
c. The children were all seen.
d. The ice cubes all froze. (Basilico 2003: 31)

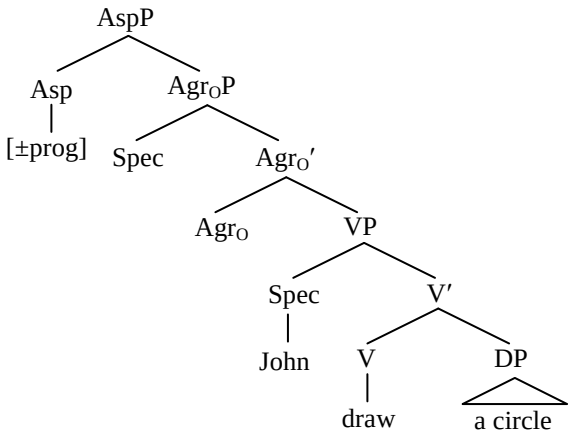
If the subject of such sentences starts out in the object position and then is raised to the subject position, (ia) and (ib) would be grammatical. Instead, the quantifier is required to appear preverbally, as in (ic) and (id). Furthermore, there is no position to which the subject *the children* in (ii) could move.

(ii) The children all are sleeping. (ibid.: 32)

(29) a. *We saw them have/having repainted the house.
b. *We saw her be(ing) tall. (Felser 1998: 358)

Alternatively, Felser analyzes the complements of perception verbs as projections of an aspectual head, which she calls AspPs. She assumes that Asp is located between T and V, as illustrated below:

(30)



(Felser 1998: 360)

Furthermore, manner adverbs, but not temporal adverbs, may appear in the complement clauses, as in (31).

(31) We saw him look frequently/*often at the wall. (ibid.: 361)

This indicates that there is a head movement of the verb in the complement clause to Asp, since manner adverbs are VP adjuncts.

Felser claims that one of the most important properties of complements of perception verbs is that they exclude stative predicates. The non-finite clausal complement of a perception verb must contain a stage-level predicate. Individual-level predicates are unable to appear in the complement of perception verbs, as in (32).

(32) a. *We saw John have a car.
b. *We saw Mary be tall. (ibid.)

Kratzer (1995) argues that only stage-level predicates provide an event argument, which must be assigned to a syntactic position. According to Kratzer, all arguments but the highest argument are realized within the lexical projection of the predicate,

and the external argument of individual-level predicates is generated in SPEC-Infl. Felser adopts this notion, suggesting that event arguments are generated in SPEC-Asp and individual-level predicates fail to project AspP. This means that only stage-level predicates project AspP, and the event argument is a true external argument because it is an argument of the entire VP. Thus, the structure for stage-level predicates is as follows:

(33) $[_{AspP}$ e $[_{Asp'}$ Asp $[_{VP}$ DP $[_{V'}$ V …]]]] (Felser 1998: 369)

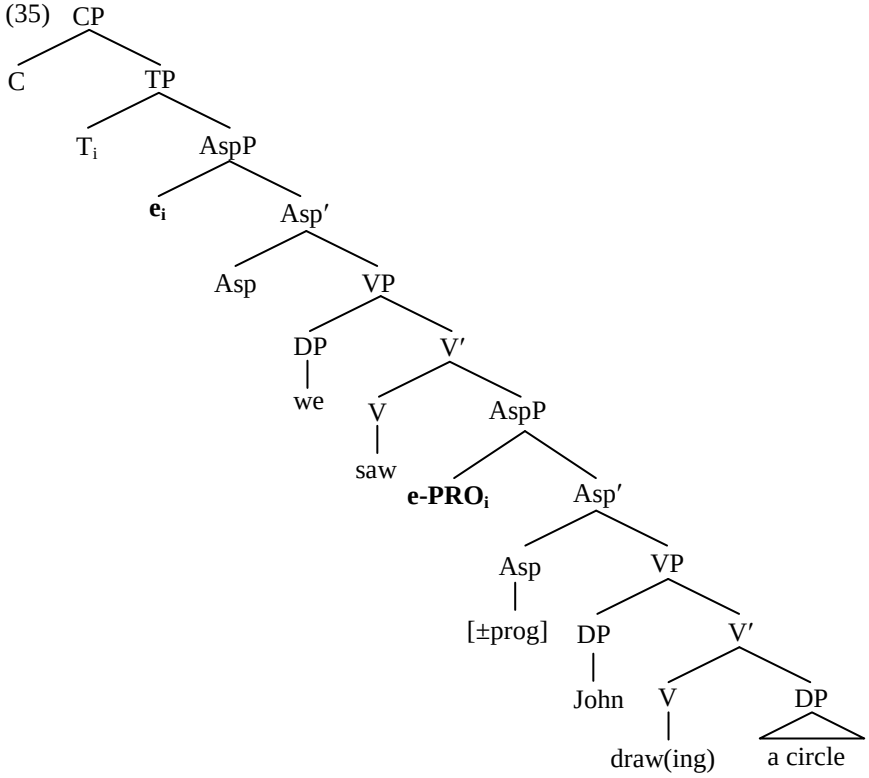
Note that Asp contains the grammatical feature [±prog], which is spelled out as *-ing* in English if it is valued [+prog]. The proposal that individual-level predicates do not project Asp is consistent with the fact that individual-expressions cannot appear in the progressive. Since perception verbs select only Asp for a complement, individual-predicates never appear in the complement clause of perception verbs.

The other important notion about perception complements is that the time interval taken up by the event described by a perception verb complement includes the time interval taken up by the matrix event, which Felser calls *the Simultaneity Condition*. Following Rizzi's (1986) notion that an empty category requires an index, Felser assumes that the event argument must be assigned a temporal index by T. Recall that T is not projected in the complement of perception verbs. Thus, a single T needs to be linked to two distinct event arguments, which is consistent with the Simultaneity Condition. In order to support this, Felser proposes the following hypothesis:

(34) Event Control Hypothesis
In direct perception constructions, the perception verb functions as a control predicate in that its event argument controls the event argument provided by the embedded predicate. (Felser 1998: 370)

Felser assumes that *e*-PRO functions as the event argument in the embedded clause, which is controlled by the event argument in the matrix clause. Therefore, the syntactic structure for perception verbs corresponds to (35), where Agr-projections have been omitted for expository purposes.

(35)



(Felser 1998: 371)

Given this structure, Felser suggests that passive participles fail to provide an event place, and that no event control relation between the matrix clause and the complement clause can be established. She claims that this is the reason why a sentence like (36) is unacceptable.

(36) *John was seen draw a circle. (ibid.: 379)

In this vein, the unacceptability of (36) is analogous to that of constructions involving obligatorily-controlled PRO, as in (37b).

(37) a. Mary$_i$ promised John PRO$_i$ to leave.
b. *John$_k$ was promised t_k PRO to leave (by Mary$_i$).
c. We e$_i$ saw John e-PRO$_i$ draw a circle.
d. *John$_k$ was seen t_k e-PRO draw a circle. (ibid.: 380)

Furthermore, Felser assumes that inserting infinitival *to* rescues passives like (36).

(38) a. John$_i$ was seen t_i to draw a circle.
b. *We saw John to draw a circle. (Felser 1998: 380)

According to Felser, *to*-infinitives are full IPs, and no direct perception is involved in that case. Thus, the event argument of the complement clause can be locally bound by *to* in (38a). On the other hand, since adding the infinitival marker is the only way to rescue sentences like (36), sentences like (38b) are ruled out because insertion of *to* blocks event control.

Finally, Felser's analysis can predict the restrictions on bare plurals in perception constructions. Bare plural subjects like *dinosaurs* in (39a) are ambiguous because they have existential and generic readings.

(39) a. Dinosaurs ate kelp. ⇒EX/GEN
b. We saw dinosaurs eat(ing) kelp. ⇒EX/*GEN (ibid.)

In order for bare plural subjects to have a generic reading, they must occupy SPEC-T. Since perception complements do not project TP, it is impossible for the bare plural subjects in the complement of perception verbs to have generic readings.

2.4. Examination of Felser (1998)

Felser's analysis is advantageous because it can correctly account for the simultaneity between the events of the matrix clause and the complement clause; however, it faces some technical and empirical problems.

First, as Basilico (2003) points out, two questions remain about Felser's analysis: (i) Is there really a control relation between the events of the matrix clause and the complement clause? (ii) Is it true that passives lack an event argument?

Basilico argues that the simultaneity of the events does not necessarily mean that the subordinate event argument is controlled by and coindexed with the matrix event argument. When two arguments are coindexed, they must be identical in reference. Thus, if Felser's analysis were correct, the event in the matrix clause and the event in the embedded clause should be identical. Events are associated with locations in space and time. Thus, the location of the matrix event and the subordinate event must be identical. However, the locations of the two events are clearly different in the following example:

(40) While sitting in my office, I saw the car hit the pedestrian in the street. (Basilico 2003: 21)

In addition, Basilico points out that Felser does not give independent evidence for the claim that passives lack an event argument. This claim is crucial for her

explanation of the unacceptability of sentences like (36). If passives lacked an event argument, they would behave like individual-level predicates. However, they are different since individual-level predicates do not appear in existential sentences, as in (41a).

(41) a. *There are linguists tall.
b. There were warning issued to the residents. (Basilico 2003: 21)

While individual-level predicates are not tied to a particular time and place, passives are clearly eventive. Therefore, the proposal that passives do not project an event argument is untenable.

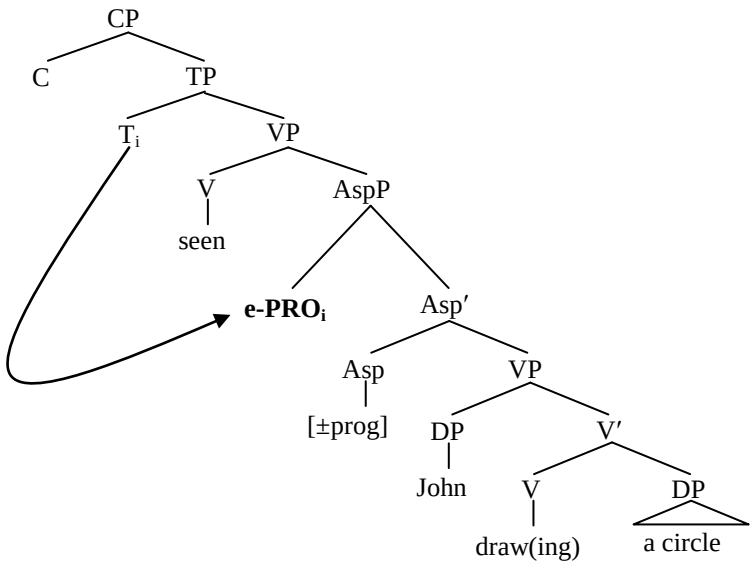
Moreover, even if the claim that passives do not project an event argument is correct, we cannot account for why the event argument of the complement clause cannot be assigned a temporal index. According to Felser, in order for the matrix T to bind the event argument of the subordinate clause in the active, the matrix T must simultaneously bind both event positions, as in (42).

(42) $[_{CP}\ C\ [_{TP}\ T\ [_{AspP}\ e_1\ [_{VP}\ V\ [_{AspP}\ e_2\ VP]]]]]$. (Felser 1998: 372)

*

In (42), however, the multiple binding by the matrix T is blocked by the presence of the coindexed c-commanding event argument contained in the higher verb. Then, let us consider the binding relation in the passive. Although Felser does not explicitly present the syntactic structure for the passive of perception verbs, it would be as follows:

(43)



There is no intervening event argument between the matrix T and the event argument of the complement clause, and there is no clear reason why T cannot control e-PRO. In this respect, Felser's explanation of the unacceptability of (36) is untenable.

Finally, if Felser's proposal that passives like (36) are rescued by the insertion of *to* is correct, it is still a mystery as to why idiom chunks cannot appear in the passive of perception verbs, as in (25), repeated as (44).

(44) a. I saw the shit hit the fan.
b. *The shit was seen to hit the fan. (= 25)

If the sole difference between (44a) and (44b) were the appearance of *to*, (44b) would be as acceptable as (44a), contrary to fact.

2.5. Review of Basilico (2003)

Basilico (2003) analyzes small clauses (SCs) as Top(ic)P and proposes that the complements of perception verbs are SCs. He treats the italicized strings in (45) as two representative SCs.

(45) a. We consider the guard intelligent.
b. We saw *the guard leave*. (Basilico 2003: 1)

He calls SCs like (45a) adjectival SCs and SCs like (45b) verbal SCs.

According to his analysis, the syntax of adjectival SCs and verbal SCs are quite different. He observes that verbal SCs involve a thetic predication, while adjectival SCs involve a categorical predication. With a categorical predication, the subject is singled out from the event itself, and the predicate ascribes a property to this subject. With a thetic predication form, the subject is not singled out, but instead is introduced as one of the event participants. In the former case, the subject forms the topic of the clause, but in the latter case, the subject is not a topic. According to Raposo and Uriagereka (1995), sentences with stage-level predicates involve thetic predications, whereas sentences with individual-level predicates involve categorical predications. As Felser (1998) points out, Basilico (2003) also observes that verbal SC complements allow only eventive, stage-level predicates and disallow individual-level predicates, as shown below:

(46) a. The burglar saw the prisoner escape.
b. *The burglar saw the prisoner know French. (Basilico 2003: 4)

In contrast, adjectival SC complements allow individual-level predicates, as in (47).

(47) a. The guard considers the prisoner intelligent.
b. The guard judged the work acceptable. (Basilico 2003: 4)

Considering these facts, Basilico suggests that the subject of adjectival SCs and that of verbal SCs are located in different positions.

In order to support this notion, he takes up some examples where a *wh*-phrase is extracted from the postverbal DP, as follows:

(48) a.??Which subject$_i$ do you consider [a book about t_i] too boring for your class?
b.??Who$_i$ did you find [a photograph of t_i] rather unattractive?
c.??Who$_i$ did you judge [a rumor about t_i] false?

(49) a. Which planet$_i$ did you see [a picture of t_i] appear on your computer screen?
b. Who$_i$ did you let [a rumor about t_i] spread around the entire department?
c. Which president$_i$ did you watch [a picture of t_i] burn in the wastebasket? (Basilico 2003: 5)

He observes that extraction from the postverbal DP with perception and causative verbs is better than extraction from the postverbal DP with opinion verbs. He ascribes the unacceptability in (48) to the violation of the Subject Condition, which indicates that the subjects of adjectival SCs are typical subjects and the subjects of verbal SCs behave like objects. The subject of an adjectival SC has moved out of the domain of the θ-role-assigning head of the SC into a functional projection (FP). On the other hand, the subject of a verbal SC has not moved out of the domain of the head that assigns it a θ-role.

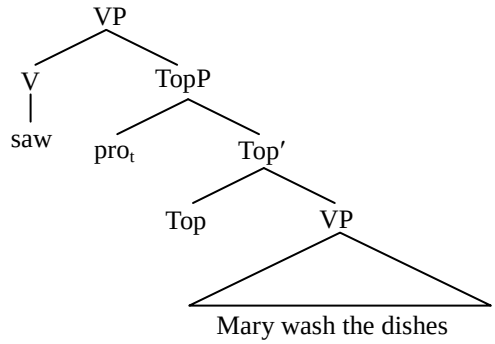
(50) a. [FP DP$_i$ [AP t_i A]]
b. [$_{FP}$ [$_{VP}$ DP$_i$ V]]

Since adjectival SCs involve a categorical predication, where the subject is singled out, the subject becomes the topic of the clause. In other words, the subject of an adjectival SC is raised out of the lexical head of the SC and occupies a topic position. With verbal SCs, on the other hand, the subject does not form a topic and is not raised to the subject position. Basilico assumes that the functional projection in (50) is Topic Phrase (TopP). Thus, the subject of an adjectival SC is raised to SPEC-Top. However, there is no such movement in verbal SCs. According to Raposo and Uriagereka (1995), with a thetic predication, the entire predicate becomes what the sentence is about and hence the topic of the clause. Tense or some other verbal functional element is the topic of such sentences. The trouble is that verbal SCs lack any sort of verbal functional element; they do not occur with any tense marking, modals, or auxiliaries, as in (51).

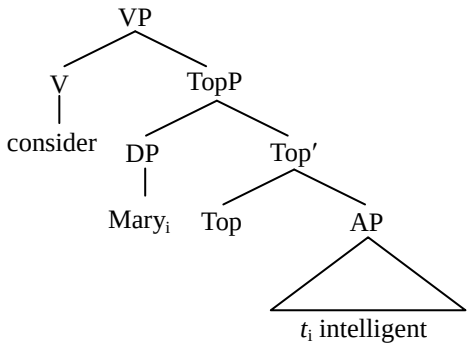
(51) a. *The policeman saw the prisoner left.
b. *The policeman saw the prisoner can leave.
c.??The policeman saw the prisoner be arrested.
d. *The policeman saw the prisoner be leaving. (Basilico 2003: 9)

Instead, he suggests that there is a null pronominal element that functions as the stage topic of verbal SCs. He proposes that this null element is the spatiotemporal (event) argument, expressed in the syntax as *pro*. In his proposal, *pro* has an index *t*, which gives the time and location of the stage. Therefore, *pro* functions as the topic of verbal SCs.

(52) a.

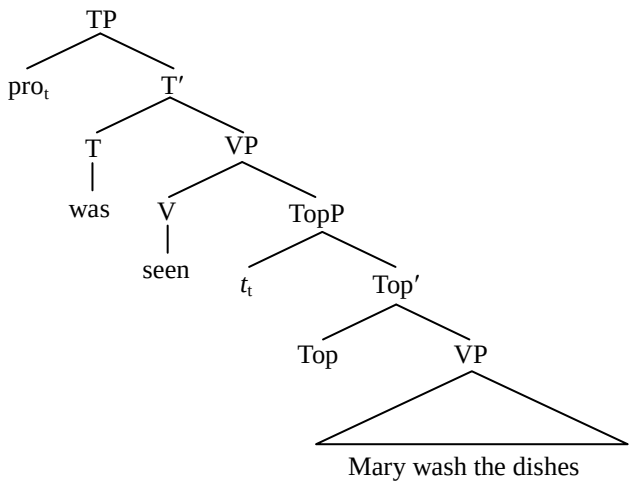


b.

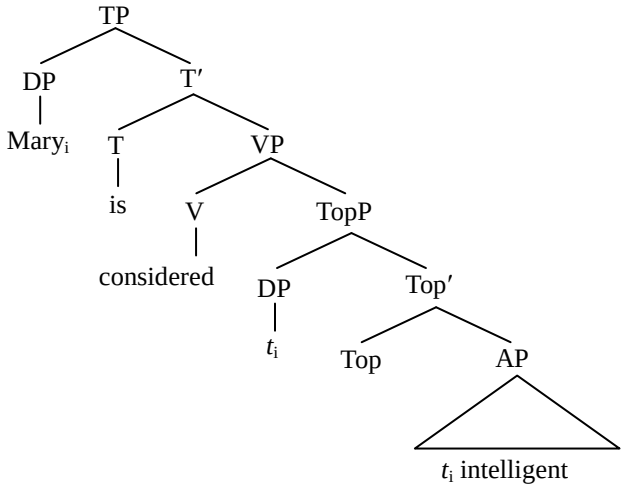


Considering the above discussion, Basilico explains why the subject of a verbal SC cannot be passivized, while that of an adjectival SC can, by presenting the following structures:

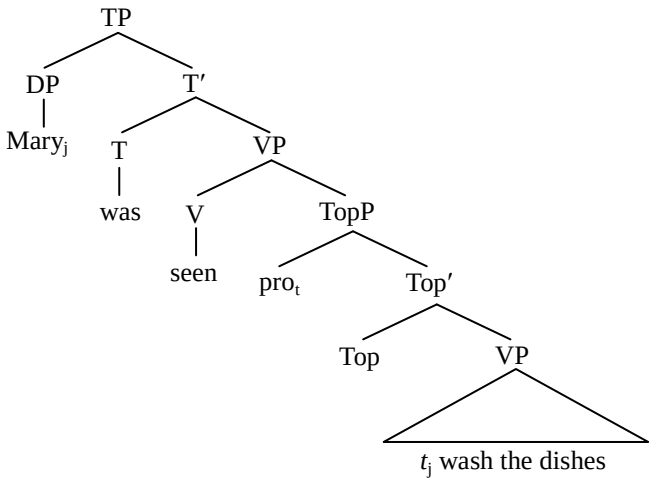
(53) a.


TP
pro$_t$
T′
T
VP
was
V
TopP
seen
t_t
Top′
Top
VP
Mary wash the dishes

b.


TP
DP
T′
Mary$_i$
T
VP
is
V
TopP
considered
DP
Top′
t_i
Top
AP
t_i intelligent

c.


TP
DP
T′
Mary$_j$
T
VP
was
V
TopP
seen
pro$_t$
Top′
Top
VP
t_j wash the dishes

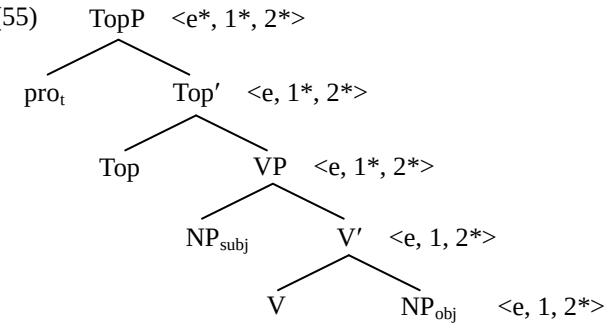
Note that although this *pro* refers to an event, it has a nominal (D-) feature. Thus, when the matrix verb is passivized, it is not *Mary* but *pro* in (53a) that is the closet nominal element to be attracted by T. Basilico assumes that the derivation in (53a) crashes because *pro* cannot check the nominative Case feature of T. This problem does not arise in (53b) since there is no intervening element between T and *Mary*. The derivation in (53c) violates economy conditions, since *Mary* is not the closest element attracted by T.

In Higginbotham's (1985) system, transitive verbs such as *eat* take three arguments, the two typical arguments that are the agent and patient of the verb plus an event argument.

(54) eat <e, x, y>

The *x* and *y* arguments are saturated by the DPs, i.e. the subject and the object. The event argument, on the other hand, is saturated after combining with I(nfl) in a process called *θ-binding*. Basilico proposes that in a verbal SC, the event argument, i.e. *pro*, must be introduced syntactically to saturate the event argument position, since verbal SCs lack I. This case is shown in (55), where a star by the argument position in the θ-grid shows that particular argument position has been saturated.

(55)



(Basilico 2003: 11)

At this point in the analysis, we need to account for why *pro* is required to appear in TopP and why *pro* is allowed in English. To answer the first question, let us observe the following Italian examples:

(56) a. Questa mattina, la mostra è stata visitata da Gianni.
this morning the exhibition was visited by Gianni
Più tardi, **e*/egli/lui ha visitato l'università.
later he has visited the university
'This morning, the exhibition was visited by Gianni. Later, he visited the university.'

b. Questa mattina, Gianni ha visitato la mostra. Più tardi, e/?egli/?lui ha

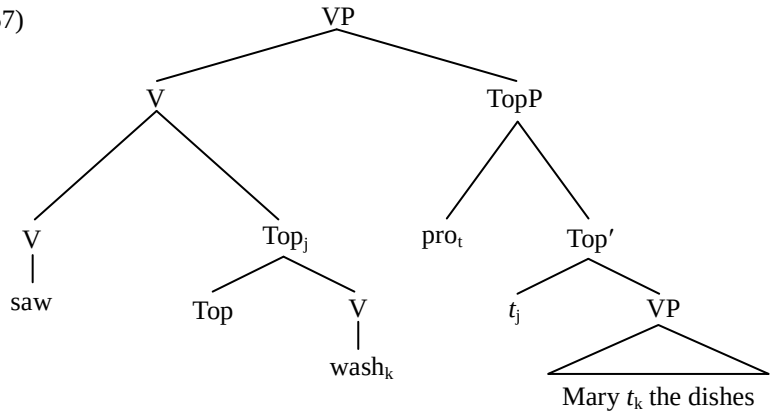
visitato l'università. (Basilico 2003: 16–17)

Null subjects can be used in Italian when the antecedent of the null subject is the topic of the discourse. The antecedent of the null subject is inside the *by*-phrase in (56a), which is not a topic. On the other hand, in the active sentence in (56b), *Gianni* is the subject, which can be a topic, and the subject of the following sentence can be null. A Null pronoun is used only when its antecedent is maximally prominent in the discourse, i.e., when it is topical. Thus, there is a close relationship between *pro* and topics, and *pro* must be in a topic position in order to be licensed.

As for second question, we can propose that *pro* can appear in English because this *pro* lacks φ-features. Italian has rich agreement in the verb, which is essential for *pro* to acquire its φ-features. Unlike the *pro* that refers to individuals, event *pro* does not need to set its φ-features.

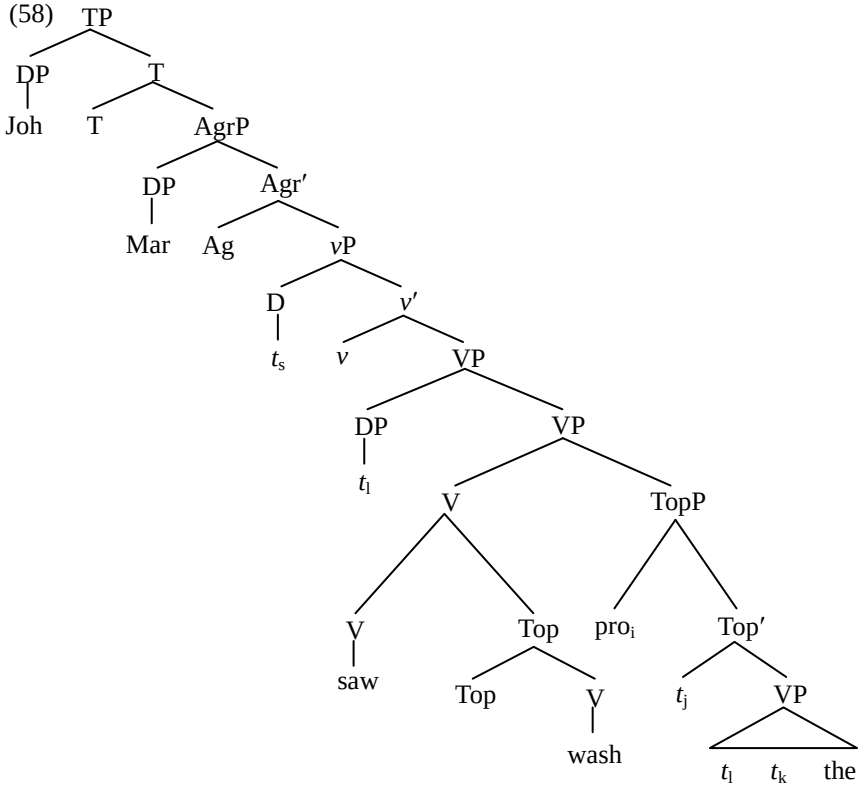
As we have seen in (53a), *pro* blocks the raising of the subject of a verbal SC to the matrix subject position in the passive. This seems to be problematic for the Case assignment to the SC subject in the active, since *pro* seems to intervene between the Case-assigner and the SC subject. To account for this, Basilico adopts Stowell's (1991) proposal that the embedded predicate of an adjectival SC in English undergoes head movement at LF and incorporates into the matrix verb. Basilico extends this analysis to verbal SCs. The verb moves to Top, and the Top-V complex then moves to the matrix V at LF, as in (57).

(57)



Note that after this LF movement, the specifiers of TopP and the matrix VP become equidistant from *Mary* as a result of the movement of the head of TopP. According to Basilico's analysis, the specifier of VP is a possible landing site, since it is not a θ-position. Thus, *Mary* can be raised to SPEC-Agr$_O$ via SPEC-V, as illustrated in (58).

(58)



Furthermore, in order to account for the derivation of sentences like (59), Basilico assumes two separate lexical items, *made* and *was made*, as in (60).

(59) a. The prisoner was seen to leave.
b. The prisoner was made to leave. (Basilico 2003: 29)

(60) a. made [$_{VP}$ the prisoner leave]
b. was made [$_{NP}$ the prisoner] [$_{CP}$ PRO to leave] (ibid.)

The active form of perception verbs is derived from (60a), while sentences like (59) are derived from (60b). Basilico presents the following contrast as the evidence for this claim:

(61) a. The prisoner was made to wash the floor.
b. The floor was made to be washed. (ibid.)

In (61a), the embedded infinitival is interpreted as a caused event, which indicates that the infinitival *to wash the floor* as a whole is the complement of the verb *was made*. In (61b), on the other hand, the infinitival *to be washed* is interpreted as an

adjunct, i.e. purpose close interpretation, accounting for why *the floor* was created. If the embedded infinitival is passivized, it loses the complement interpretation. This shows that the complement of the verb *was made* is not IP, as shown in (62).

(62) [$_{IP}$ was made [$_{IP}$ to be washed [the floor]]]

This fact supports the argument structure in (60b).

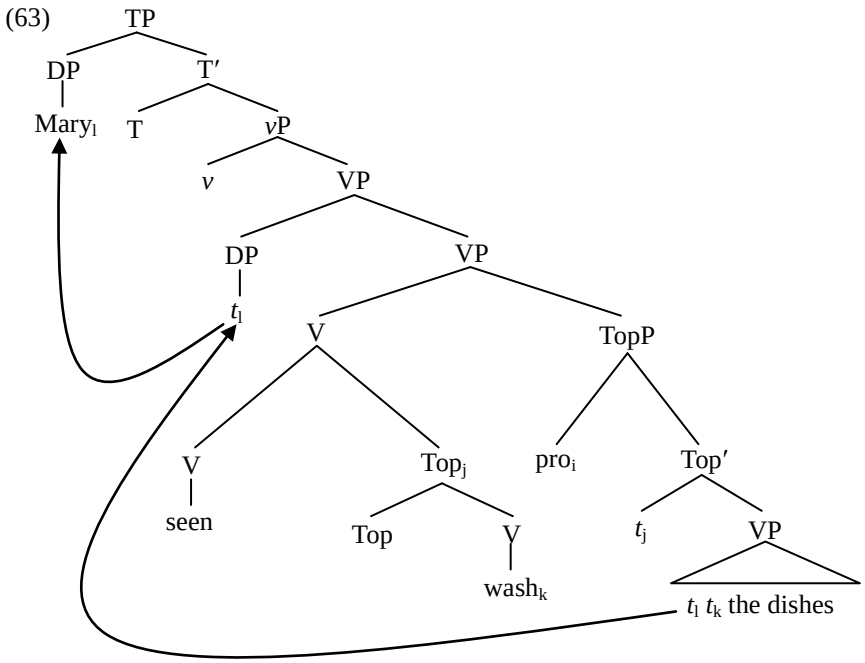
2.6. Examination of Basilico (2003)

Basilico's analysis is able to capture the important notion that the complement of perception verbs must contain a stage-level predicate, which Felser (1998) also points out. In addition, Basilico's analysis can explain why clausal idioms cannot appear in the passive of perception verbs. As we see in (60b), the passive form of perception verbs cannot take clausal idioms as complements.

However, even Basilico's analysis faces some technical and empirical problems.

First, although Basilico assumes that the subject of a verbal SC is raised to the specifier of the matrix VP due to the movement of the head of TopP to the matrix V, it is unclear why it is impossible for the SC subject to move to SPEC-V in the passive, as shown below:

(63)



Basilico may argue against this question by adopting Bennis and Hoekstra's (1989) observation that verb raising cannot apply when the matrix verb has been passivized in Dutch. However, there is no such evidence in English. What prevents the Top-V complex from moving into passivized verbs is still unclear.

Second, assuming the two separate lexical items as in (60) seems to be an ad hoc analysis. The causative verb *make* can also appear in the *get* passive, as shown in (64).

(64) They got made to leave.

Then, we must assume the following lexical item in addition to (60):

(65) got made NP CP

Therefore, Basilico's analysis of the derivation of (59) is untenable.

3 PROPOSAL

To sum up the previous analyses, we must pay attention to the following properties of perception and causative verbs:

(66) a. The active and passive forms of perception verbs are derived from different structures.
b. The complement of perception verbs must contain a stage-level predicate.

Considering these properties, I adopt Basilico's (2003) analysis, which can account for (66), with some important modifications.

In Honda (2012), I propose that both the active and the passive are derived from the structure in (67).

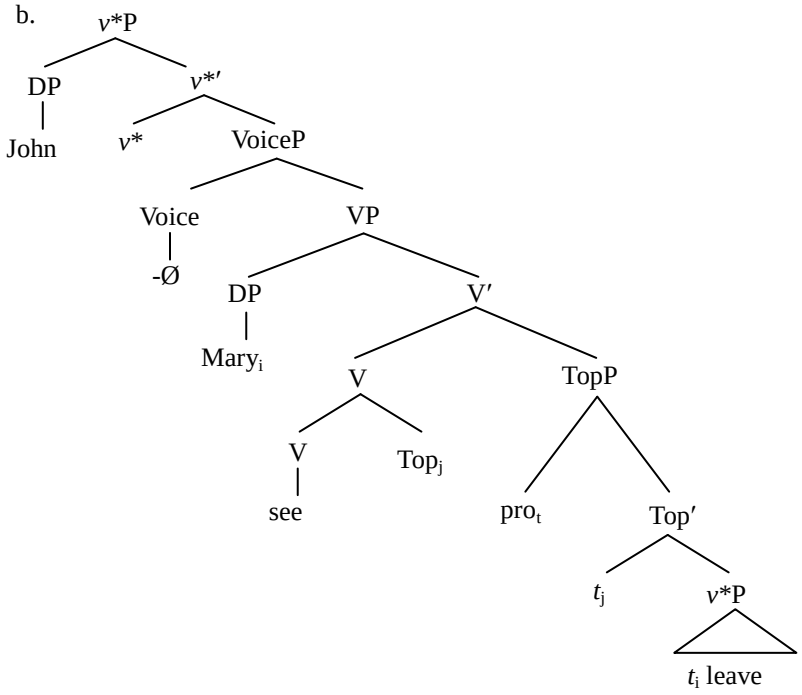
(67) $[_{v^*P}$ EA $[v^*$ $[_{VoiceP}$ Voice $[_{VP}$ V IA$]]]]$
EA = external argument, IA = internal argument

The difference between the active and the passive is related to the head of VoiceP. If the head of VoiceP is the phonetically null -*Ø*, the active is derived. On the other hand, the passive is derived if the head of VoiceP is the passive morpheme -*en*. In order to support the structure in (67), I have proposed the following conditions in (68).

(68) a. *v** merges DP iff *v** selects -Ø.
b. *v** merges IMP and is assigned an EPP-feature iff *v** selects *-en*.

Following the structure in (67), I propose that the syntactic structure of (69a) is (69b).

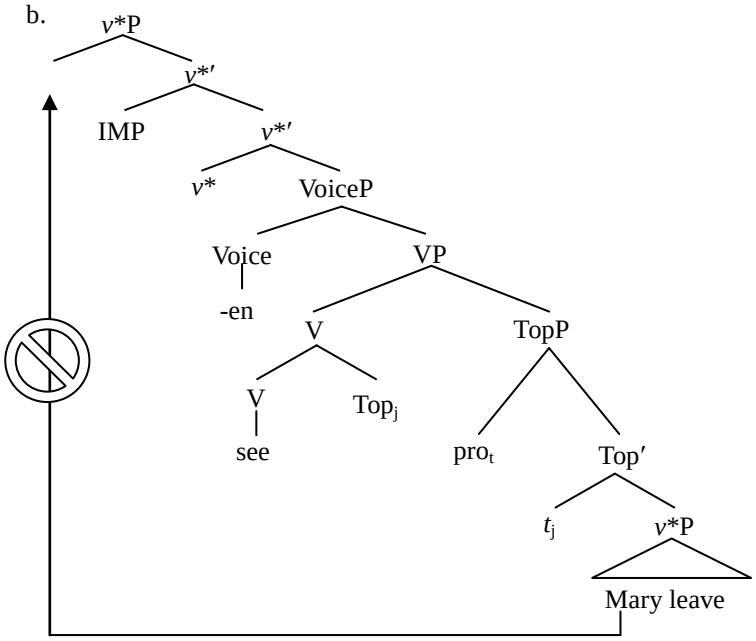
(69) a. John saw Mary leave.
b.



Unlike Basilico (2003), I assume that only the head of TopP moves into the matrix verb in narrow syntax. This movement makes the specifier of the matrix verb and the specifier of TopP equidistant from the SC subject *Mary*. Thus, the SC subject is raised to SPEC-V and assigned accusative Case by V, which inherits the Agree-feature of *v**.

On the other hand, the structure of the ungrammatical passive in (70a) will be (70b).

(70) a. *Mary was seen leave.
b.



Note that the specifier of *v** and the specifier of TopP are not equidistant from *Mary*, which causes *pro* to intervene between *v** and the SC subject *Mary*. If *pro* is raised to SPEC-*v** instead of *Mary*, the derivation crashes as we have already seen in (53a). For this reason, perception and causative verbs with bare infinitives cannot be passivized.

4 WHAT LOOKS LIKE THE PASSIVE COUNTERPART

The next question is how sentences like (71) are derived.

(71) a.?*Mary was seen to leave by John.
b. Mary was made to run by John.

Most of my informants, however, judged sentences like (71a) to be unacceptable. Some of them pointed out that putting the *by*-phrase after *seen* makes the sentence a little better, as in (72), but it still has a different meaning from the active sentence in (69a).

(72) ??Mary was seen by John to leave.

One of the informants claimed that in the case of the passive, the meaning of the verb *see* can be metaphorical, i.e., to become aware of something. This notion follows Felser's (1998, 1999) observation, and we can conclude that the structure of (72) is quite different from (69). Felser claims that the sense of direct perception is lost in the passive. Instead, the passive forms of perception verbs describe an act of indirect (or epistemic) perception. This is the reason why the verb *watch*, which only has the sense of direct perception, does not have the passive counterpart.

(73) a. We watched John draw a circle.
b. *John was watched (to) draw a circle. (= 24)

Thus, the analyses that the active and passive forms of perception verbs are derived from the same base-structure, as proposed in Hornstein et al. (2008), are untenable. In fact, sentences like (69a) cannot be passivized at all, and I assume that contrary to the literature, the string *be seen to* or *be heard to* can appear only in the following examples, which do not have any active counterparts:

(74) a. *I saw John know French.
b. John was seen to know French. (= 8)
(75) a. *I heard John have an accent.
b. John was heard to have an accent. (= 9)

As we have already seen, Hornstein et al. suggest that these sentences, which have propositional/epistemic readings, behave like *wager*-class verbs.

On the other hand, passive sentences of causative verbs like (71b) are perfectly acceptable. However, (76b) does not have the active counterpart, as in (76a).

(76) a. *We made John be in need of assistance.
b. John was made to be in need of assistance. (Inoue 1992: 144)

Thus, the active sentence in (77), which looks like the active counterpart to (71b), and (71b) are derived from different structures.

(77) John made Mary run.

These are reminiscent of *wager*-class verbs, as in (78), in that there is no active-passive pair.[4]

[4] Active sentences of *wager*-class verbs are allowed when the embedded subject undergoes *wh*-movement. One of my informants accepts (i), although most of them do not.
(i) (*)Who did John make to run?
I am not sure why most native speakers do not accept sentences like (78c) in causative verb sentences, and I leave this issue for future research.

(78) a. *John wagered Peter to be crazy (Bošković 1997 :52)
b. Peter$_i$ was wagered by John [t_i to be t_i crazy] (ibid.: 55)
c. Who$_i$ did John wager [t_i to be t_i crazy] (ibid.:61)

Therefore, we expect that the perception and causative verbs that take *to*-infinitives as complements must have a similar syntactic structure to *wager*-class verbs.

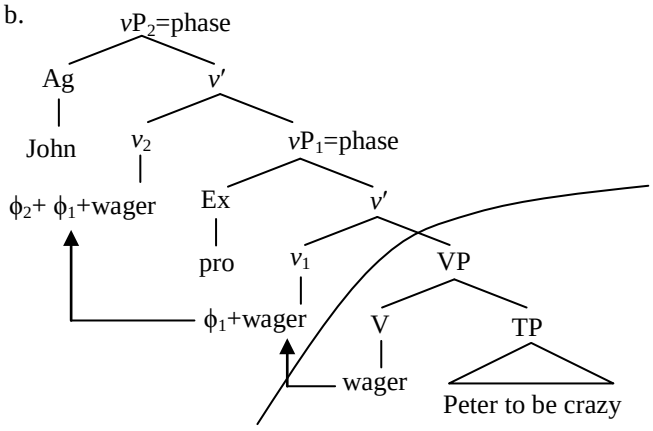
Bošković (1997) explains this peculiar behavior of *wager*-class verbs within an Agr-based analysis, but we do not assume Agr projection. Nishikawa and Matsumoto (2007) present a phase-based approach to verbs of this class.[5] They note that *wager*-class is different from *believe*-class in that only the former assigns an Agent θ-role, and that they are similar because they both assign Experiencer θ-role, as shown in (79)–(80).

(79) a. Mike viciously alleged/announced her to be a liar.
b.?*Mike viciously believed her to be a liar.
(80) a. Mike personally alleged/announced her to have accepted his proposal.
b. Mike personally expected her to accept his proposal.
(Nishikawa and Matsumoto 2007: 235)

The verbs *allege* and *announce* belong to *wager*-class. Manner adverbs like *viciously* may occur only in sentences having underlying Agents. This is the reason why (79b) is unacceptable. On the other hand, the adverb *personally* appears only in sentences with Experiencers. Nishikawa and Matsumoto conclude that *wager*-class verbs project both Agent and Experiencer, while *believe*-class verbs project only the latter.

Taking this analysis into consideration, they assume the structures for *wager*-class verbs and *believe*-class verbs as follows:

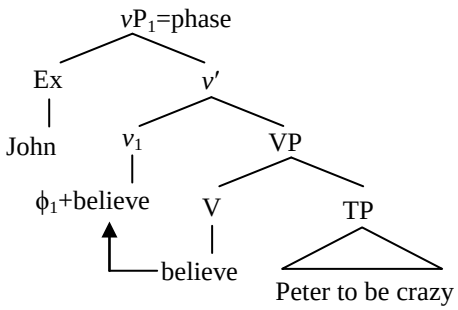
(81) a. *John wagered Peter to be crazy. (= 78a)
b.



(Nishikawa and Matsumoto 2007: 236)

[5] I thank Koji Fujita for pointing out this study to me.

(82) a. John believed Peter to be crazy.
b.



(Nishikawa and Matsumoto 2007: 236)

In (81b), V head moves into ϕ_1 and then the ϕ_1 + V complex moves into ϕ_2. According to their analysis, $v\mathrm{P}_1$ is a phase, which takes Experiencer *pro* as an external argument.[6] Moreover, $v\mathrm{P}_2$ is also a phase, which takes Agent *John* as another external argument. They assume that only v_2 can assign accusative Case, and that v_1 just heads a phase. Note that v_2 cannot access *Peter* since $v\mathrm{P}_1$ is a phase and only the specifier and the head of $v\mathrm{P}_1$ are accessible to the external probe v_2. This is the reason why (81a) is ungrammatical. In (82b), on the other hand, v_1 can assign accusative Case to *Peter*.

Moreover, they also account for the reason why the *wh*-phrase in (83) can be assigned Case.

(83) Who did John wager to be crazy? (= 78c)

According to their analysis, the *wh*-phrase is raised to SPEC-v_1 and is assigned Case in that position by v_2.[7]

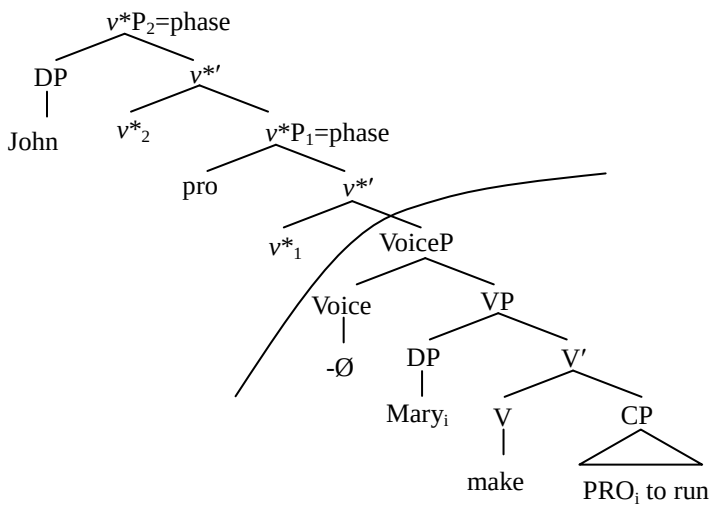
Adopting their analysis, I propose the following structure for the perception and causative verbs that take *to*-infinitives:[8]

[6] One might claim that assuming *pro* in English is problematic. However, if we adopt Bošković's (1997) assumption that an argument can move from one θ-position to another θ-position, we can claim that *John* is base-generated at SPEC-v_1 and then moves to SPEC-v_2 in (81b). This analysis is in the same vein as Fujita and Matsumoto (2005).

[7] Nishikawa and Matsumoto do not refer to the passive in (78b).

[8] I am not sure whether the two external arguments are Agent and Experiencer in this case. I tentatively assume that there are also two light verbs in this structure.

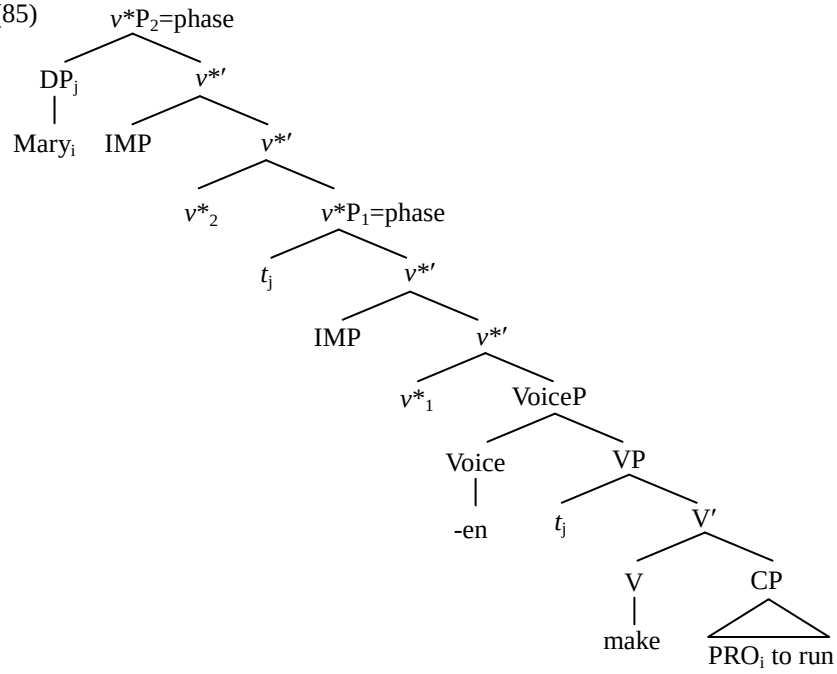
(84)



In (84), I partially adopt Basilico's analysis in that the lexical verb takes two internal arguments, i.e. DP and CP whose subject is PRO.[9]

Furthermore, I propose the following structure as the passive counterpart to (84):

(85)



[9] I assume that the Agree-feature on v^*_2 remains on v^*_2 because v^*_2 does not select V in (84).

In (85), I suggest that each *v** merges *IMP* and is assigned an EPP-feature.

By partially adopting Basilico's argument structure in (60b), the structure in (85) can also explain why (61a) and (61b), which I repeat here as (86a) and (86b), respectively, have different interpretations.

(86) a. The prisoner was made to wash the floor.
b. The floor was made to be washed. (= 61)

This analysis also accounts for the clausal idiom examples, as in (87).

(87) a. I saw the shit hit the fan.
b. *The shit was seen to hit the fan. (= 25)

As we have already discussed, the passive form of a perception verb describes an act of indirect (or epistemic) perception. If (87b) had the same structure as *wager*-class verbs, we could not explain its deviance from that structure. Alternatively, if we adopt the structure in (85), we can explain why (87b) does not have the idiomatic reading because the verb takes only *the shit* as an argument and it cannot take the clausal idiom as a complement.

5 Conclusion

In this paper, we have discussed the reason why the perception and causative verbs that take bare infinitives cannot be passivized. This is because *pro*, which is merged at SPEC-Top, intervenes between *v** and the embedded subject. Thus, the embedded subject cannot be raised to the subject position. This intervention is not problematic for accusative Case assignment to the embedded subject in the active. In addition, the passive forms of perception and causative are derived from a structure that is similar to the structure of *wager*-class verbs, but they are different in that the former takes two internal arguments, i.e. DP and CP.

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Takahiro Honda
hondat33@gmail.com