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The hidden side of clausal complements

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Abstract I propose that a moved clausal complement must involve a DP structure headed by a covert determiner. This proposal explains the fact that the base-generated position of a moved clausal complement must show properties of DPs even though the moved constituent appears to be a CP. I argue that the necessity of the DP structure comes from properties of an independently motivated mechanism for interpreting structures involving a movement dependency under the copy theory of movement. Together with a particular theory of counter-cyclic merger, the proposed analysis also captures (anti-)reconstruction effects exhibited by movement of a clausal complement.

Keywords (Anti-)reconstruction · Clausal complements · Copy theory of movement · Counter-cyclic merger · Determiners

1 Introduction

In the recent development of the theory of movement, movement has been viewed as a copying/merging process of a single constituent in different positions (Chomsky 1993, 2000, 2001). This theory of movement, known as *the copy theory of movement*, has been supported by various types of empirical data in the literature (Fox 1999; Sauerland 1998, among many others). The copy theory of movement provides a principled explanation of a reconstruction effect, in which a moved element is interpreted in its pre-moved position as if it had not undergone movement. This reconstruction effect is naturally derivable under the copy theory of movement. Since exactly the

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same material is present in both the dislocated position and the original position, it is possible to interpret a lower copy of a moved element in the semantic component.

Under this view of movement, movement operations should never alter any property of a moved element during the course of the derivation (but see Sect. 4 for a qualification). However, there is a set of facts that could be considered a challenge to this particular aspect of the copy theory of movement. It has been pointed out since the 1970s that when a clausal complement undergoes movement (e.g., in sentential subject and in topicalization cases), the tail of the chain appears to obligatorily show properties of DPs, even though there is at least superficially no sign of a DP status in the head of the chain (see Alrenga 2005, for an overview of the relevant facts). There are conceivable approaches that can deal with this category mismatch puzzle in a way that is compatible with the copy theory of movement. One such approach, which was first proposed by Koster (1978) and was extensively defended by Alrenga (2005), is to deny the premise that what actually undergoes movement in such a case is a CP complement and to postulate instead the movement of a phonologically empty DP element.

In this article, I present a novel fact that casts doubt on a Koster-style solution to the category mismatch puzzle. A crucial counter-argument is that a reconstruction effect can be seen in cases involving overt displacement of clausal complements. In other words, a moved clausal complement can be interpreted in its pre-moved position. The presence of reconstruction effects in such circumstances is not expected under a Koster-style analysis and indicates that a clausal complement actually partakes in the formation of a movement chain. However, once this conclusion is accepted, the category mismatch puzzle reemerges. I propose an alternative approach to this puzzle, which is also compatible with the copy theory of movement. I claim that whenever a clausal complement undergoes movement, there must exist a covert determiner (Det) on top of the CP complement.[1] I argue that the necessity of the Det structure can be attributed to properties of an independently motivated procedure for interpreting copies left behind by movement. Since the relevant Det is phonologically empty and, moreover, the covert Det structure is not available to a clausal complement that does not move (for reasons that I will discuss below), we get the impression that we are faced with the category mismatch puzzle.

In the next section, we first discuss various facts that constitute the category mismatch puzzle. In Sect. 3, we will see that structures involving movement of a clausal complement exhibit a reconstruction effect. In Sect. 4, I propose a covert Det approach to the category mismatch puzzle. Section 5 provides further evidence for the covert Det analysis, which comes from the apparently puzzling fact that movement of a clausal complement bleeds Condition C. I argue that this fact can be handled by an independently motivated theory of counter-cyclic merger if a moved clausal complement involves a Det. In Sect. 6, I discuss some implications of the proposed

[1] Moulton (2008) independently proposes the idea that a moved clausal complement involves a covert determiner in order to account for DP properties exhibited by a moved clausal complement. Since his analysis is built under the syntactic and semantic theory of clausal complements and clausal complement taking predicates that he is currently developing (see Moulton 2007a, 2007b), a comparison between his analysis and mine is left for future research.

approach for an analysis of the distribution of clausal complements and the theory of movement.

2 Category mismatches

2.1 Passives

What one may expect under the copy theory of movement would be this: When a constituent α undergoes movement, the base-generated position of α is a position where α can appear because the category of α is not changed by movement operations under the copy theory of movement. While this expectation is largely fulfilled, it appears to be defied in cases where clausal complement CPs move overtly.[2] The generalization that we can make from the behavior of this kind of movement is given in (1). This has been taken to be one instantiation of the category mismatch puzzle (see Alrenga 2005, for an overview of the evidence for (1) accumulated in the past literature).

(1) **The Moved Clausal Complement Generalization**
A clausal complement is allowed to move only if its base-generated position is one in which a DP is allowed to appear.

Empirical evidence for (1) can be found by looking at the interaction between predicates that possess a particular selectional property and movement operations that apply to clausal complements. In this section, we will see that in passives, a sentential subject is allowed only if the base-generated position of the sentential subject is an argument position of a predicate where a DP can appear.

Let us first consider predicates that cannot take a DP complement (henceforth, *hope*-class predicates). Some examples of such predicates are listed in (2) (Grimshaw 1982).

(2) a. Most baseball fans {hoped/felt/wished/insisted/reasoned} that the Giants would win the World Series.
b. *Most baseball fans {hoped/felt/wished/insisted/reasoned} that.
(Alrenga 2005:183)

Somewhat surprisingly (but as one can expect, given (1)), *hope*-class predicates do not allow for a sentential subject in passives (Alrenga 2005; Grimshaw 1982; Postal 1986, 1994; Webelhuth 1992; Williams 1981):

(3) *That the Giants would win the World Series was {hoped/felt/wished/insisted/reasoned} (by most baseball fans). (Alrenga 2005:183)

Note that *hope*-class predicates in principle can be passivized, as in (4).

[2] In what follows, I confine my discussion to *finite non-interrogative* clausal complements. I need to explore properties of *nonfinite* clausal complements on another occasion. See footnote 20 for a brief remark on the syntax of interrogative clausal complements.

(4) It was {hoped/felt/wished/insisted/reasoned} (by most baseball fans) that the Giants would win the World Series. (Alrenga 2005:183)

The flip side of the contrast between (2) and (3) can be seen by exploiting predicates that can only combine with a DP complement, as in (5) (henceforth, *capture*-class predicates) (Grimshaw 1982).

(5) a. This formulation of the rule {expresses/captures/reflects/brings out} *(the fact) that these nouns behave differently.

b. Even Aristotle contemplated *(the possibility) that the moon is made of cheese.

c. We can attribute {the observed behavior of these consonants/*that these consonants behave exceptionally} to the fact that they are coronals.

d. We have given *(the possibility) that Jack is a double agent serious consideration. (Alrenga 2005:184)

As shown in (6), *capture*-class predicates are compatible with a sentential subject in passives (Alrenga 2005; Bresnan 1995; Grimshaw 1982; Jacobson 1992; Kuno 1973; Williams 1981).

(6) a. That these nouns behave differently is {expressed/captured/reflected/brought out} by this formulation of the rule.

b. That the moon is made of cheese was even contemplated by Aristotle.

c. That these consonants behave exceptionally can be attributed to the fact that they are coronals.

d. That Jack might be a double agent has been given serious consideration. (Alrenga 2005:184–185)

The Moved Clausal Complement Generalization is further corroborated by the following set of facts. It is well known that clausal complement CPs cannot appear in the complement of a preposition in English (see Emonds 1976; Stowell 1981, among others). This constraint is referred to as the *[P CP] constraint:

(7) a. This assumption accounts for the fact that these nouns behave differently.

b. The panel deliberated over John's offer to represent them.

(Alrenga 2005:185)

(8) a. *This assumption accounts for that these nouns behave differently.

b. *The panel deliberated over that John would represent them.

(Alrenga 2005:185)

However, a violation of the *[P CP] constraint is circumvented if a clausal complement is overtly displaced in passives, as in (9) (Alrenga 2005; Rosenbaum 1967).

(9) a. That these nouns behave differently is accounted for by this assumption.

b. That John would represent them was deliberated over by the panel.

(Alrenga 2005:185–186)

Since relevant prepositions can only combine with a DP complement, the fact that overt movement of a clausal complement bleeds the *[P CP] constraint can be taken to be on a par with the fact that *capture*-class predicates allow for a sentential subject in passives.

Taken together, the facts discussed above lend strong support to the generalization in (1). The next section will provide more supporting evidence from a different type of movement operation.

2.2 Topicalization

In this section, we will see that the Moved Clausal Complement Generalization also holds for Ā-movement, more specifically, topicalization. As expected from the generalization in (1), topicalization of a clausal complement is impossible in cases where a relevant predicate belongs to the *hope*-class, as in (10), but it is possible when a relevant predicate is one of *capture*-class predicates, as shown in (11) (Alrenga 2005; Bresnan 1995; Kuno 1973; Postal 1986; Webelhuth 1992).

(10) *That the Giants would probably win the World Series, (I think that) most baseball fans reasoned. (Alrenga 2005:192)

(11) a. That these consonants behave exceptionally, we can attribute to the fact that they are coronals.

b. That the moon is made of cheese, Aristotle never should have contemplated. (Alrenga 2005:192, 202)

Moreover, a violation of the *[P CP] constraint is obviated by topicalization of a clausal complement, just like raising of a clausal complement in passives (Alrenga 2005; Bresnan 1995; Higgins 1973; Kaplan and Bresnan 1982; Postal 1994; Webelhuth 1992; Weisler 1982).

(12) a. I convinced Frank (*of) that Sonia was very competent.

b. That Sonia was very competent, I couldn't convince Frank *(of).

(Postal 1994:70)

(13) a. I insisted (*on) that Sonia attended the interview.

b. That Sonia attended the interview, I couldn't insist *(on).

(Postal 1994:70)

Together with the data from passives in the previous section, we can conclude from the topicalization facts that a gap created by movement of a clausal complement must be parsed as a DP, whether the movement involved is A-movement or Ā-movement. We will see in Sect. 4.1 that this conclusion becomes of great importance in developing an analysis of the generalization and that it plays an essential role in teasing apart possible approaches to the category mismatch puzzle.

2.3 Parasitic gaps

One possible interpretation of the conclusion reached above is to consider that a dependency established by movement of a clausal complement itself must be regarded as a dependency formed by DP movement and hence, a gap that constitutes such a dependency also must have a DP status. In this section, I present evidence for this line of reasoning from the licensing of parasitic gaps.

It is argued that parasitic gaps are licensed only when there is a dependency created by overt Ā-movement of a DP (Chomsky 1982, among many others). This point can be made by the contrast between (14) and (15). In the latter cases, overt Ā-extraction is applied to a non-DP element and the putative parasitic gap is not licensed.

(14) [$_{DP}$ Which papers] did you file without reading?

(15) a. *[How sick] did John say he felt before getting?

b. *This is a topic [about which] you should think before talking.
(Emonds 1985:91)

c. *[Unbearable], he is even when trying not to seem.

d. *[Beaten by the guards], she seems to have been while trying to avoid being. (Postal 1994:64)

Contrary to what we expect under the assumption that a clausal complement is analyzed as a non-DP category (i.e., a CP), overt Ā-movement of a clausal complement can also license a parasitic gap, as in (16).

(16) a. That John is here, Mary claimed without really believing.
(Lasnik and Saito 1992:148)

b. That the ruble is worthless, he asserted without verifying.
(Postal 1994:67)

All of the facts discussed above point to the same conclusion, namely, that movement of a clausal complement obligatorily has properties that DP movement has in every relevant respect.[3] However, the head of such a movement chain is normally parsed as a CP, which leads us to the category mismatch puzzle. In the next section, I discuss one existing approach to this puzzle and present a novel argument against it.

[3] An asymmetry in agreement between postverbal and preverbal coordinated clausal complements can be taken to provide additional evidence for this conclusion. McCloskey (1991) observes that while coordinated CPs in a postverbal position never induce agreement, as in (ia), agreement can be triggered by preverbal coordinated CPs, just like ordinary coordinated DPs, as shown in (ib).

(i) a. It seems/*seem equally likely at this point that the president will be reelected and that he will be impeached.

b. That the president will be reelected and that he will be impeached are equally likely at this point. (McCloskey 1991:564–565)

See Davies and Dubinsky (1998, 1999, 2001) and Moulton (2008) for possible analyses of this phenomenon.

3 A new argument for movement of clausal complements

In the previous section, I presented various empirical facts that constitute the category mismatch puzzle. Note, however, that this puzzle only arises under a particular premise that we have implicitly assumed so far, namely, that clausal complement CPs are base-generated in their argument position and relevant movement operations apply to such CPs. One possible approach toward tackling the category mismatch puzzle would be to reject this premise. Indeed, this is the position that Koster (1978) takes in his analysis of sentential subjects. Koster claims that an apparently moved clausal complement CP is a base-generated topic (see Emonds 1976, for a related idea) and what undergoes movement is a phonologically empty DP. Here, I refer to this covert DP as a null operator for ease of exposition. A slightly modernized version of a Koster-style analysis is illustrated in (17). A Koster-style analysis is extended to handle the topicalization of clausal complements by Alrenga (2005).

(17) $[_{\text{TopicP}}\ [_{\text{CP}}$ that these nouns behave differently$]$ $\text{OP}_1[_{\text{TP}}\ t_1$ is [captured t_1 by this formulation of the rule]]]

As extensively discussed in Alrenga (2005), a Koster-style analysis provides a straightforward explanation of the Moved Clausal Complement Generalization, once we assume that the null operator is a DP. A Koster-style analysis also captures the fact that a clausal complement never behaves like a DP when it stays in situ. In a Koster-style analysis, there is no null operator involved in such cases. Finally, the fact that a parasitic gap is licensed by Ā-movement of a clausal complement is no longer puzzling because under a Koster-style approach, this fact falls under the generalization that a parasitic gap is licensed only by overt Ā-extraction of a DP.

A Koster-style analysis is very attractive in the sense that it removes the category mismatch puzzle, which we do not have a good handle on. However, I present here empirical evidence that leads us to think that we should explore an alternative analysis. To set the stage for making this argument, let us first consider a reconstruction effect in *wh*-movement. In (18), the pronoun within the moved *wh*-phrase can be interpreted as a variable bound by the quantifier phrase (QP) in subject position. Since a pronoun can receive a bound variable interpretation only when it is interpreted within the scope of its binder, the presence of the bound variable reading in (18) indicates that the moved *wh*-phrase can be interpreted in some position below the subject in the Spec of TP.

(18) a. [Which of his_i students] did [every professor]$_i$ talk to?
b. [Which student of his_i] did you think [every professor]$_i$ talked to?
(Fox 1999:172)

Notice that the bound variable reading in question is impossible when the base-generated position of a moved *wh*-phrase is structurally higher than the QP, as shown in (19).

(19) a. *[Which of his_i students] talked to [every professor]$_i$?
b. *[Which student of his_i] did you think talked to [every professor]$_i$?
(Fox 1999:172)

The contrast between (18) and (19) suggests that the mechanism for producing a reconstruction effect should be connected to the movement mechanism. More specifically, as mentioned above, it has widely been taken as an argument in favor of the copy theory of movement (Chomsky 1993, 1995; Fox 1999, among others). Given the copy theory of movement, the lower copy of the *wh*-phrase can be used to derive the bound variable interpretation, as illustrated in the representation in (20a) posited for (18a). Note that the pronoun inside the copy is within the scope of the QP in (20a). However, there is no such copy of the *wh*-phrase in the structure in (20b) postulated for (19a). Therefore, the bound variable reading is impossible in (19).

(20) a. [[which of his_i students] did [[every professor]$_i$ talk to [which of his_i students]]]

b. *[[which of his_i students] [[which of his_i students] talked to [every professor]$_i$]]

We are now ready to discuss an empirical challenge to a Koster-style analysis. In a Koster-style analysis, the representations in (21b) and (22b) are assigned to (21a) and (22a), respectively.

(21) a. That these nouns behave differently is captured by this formulation of the rule.

b. [$_{TopicP}$ [$_{CP}$ that these nouns behave differently] OP_1[$_{TP}$ t_1 is [captured t_1 by this formulation of the rule]]]

(22) a. That these consonants behave exceptionally, we can attribute to the fact that they are coronals.

b. [$_{TopicP}$ [$_{CP}$ that these consonants behave exceptionally] OP_1[$_{TP}$ we can attribute t_1 to the fact that they are coronals]]

Particularly important for the current discussion is the characteristic property of a Koster-style analysis that a clausal complement never forms a movement dependency that connects a putative argument position and its surface position. Given the discussion about the reconstruction effect in *wh*-movement, a Koster-style analysis predicts that we would not observe a relevant reconstruction effect in cases in which a clausal complement appears in a non-argument position. In other words, a clausal complement should not be able to be interpreted in a position lower than its surface position. However, this prediction is not borne out (see also Moulton 2008 for relevant facts and discussion). Let us first consider a reconstruction effect that is found in sentential subject cases. As shown in (23)–(25), the pronoun within the sentential subject can be bound by a QP which is structurally lower than the surface position of the sentential subject.

(23) a. [That some student from his_i class cheated on the exam] seems to [every professor]$_i$ to be captured by this document.

b. [That a student from his_i class cheated on the exam] doesn't seem to [any professor]$_i$ to be captured by this document.

(24) a. [That some student from his$_i$ class cheated on the exam] seems to [every professor]$_i$ to be given serious consideration by the dean.

b. [That a student from his$_i$ class cheated on the exam] doesn't seem to [any professor]$_i$ to be given serious consideration by the dean.

(25) a. [That some student from his$_i$ class cheated on the exam] seems to [every professor]$_i$ to be believed (in) by Mary.

b. [That a student from his$_i$ class cheated on the exam] doesn't seem to [any professor]$_i$ to be believed (in) by Mary.

The availability of the bound variable interpretation in (23)–(25) can be taken as indicating that the clausal complement actually can move from the complement of *capture*-class predicates or the complement of prepositions and establish a movement dependency, as illustrated in the simplified representation for (23b) that is given in (26).

(26) [[that a student from his$_i$ class cheated on the exam] doesn't seem to [any professor]$_i$ to be [captured [that a student from his$_i$ class cheated on the exam] by this document]]

One might suggest that if the QP undergoes Quantifier Raising (QR) and takes scope over the sentential subject in (23)–(25), it is possible to explain the reconstruction effect without recourse to the copy theory of movement. However, such QR is ruled out by the weak crossover constraint. Furthermore, there is another reason to think that the QR approach is not a general account of the reconstruction effect. The QR approach cannot carry over to (23b), (24b), and (25b) because the relevant QP in these cases is a negative polarity item and it must take narrow scope relative to negation, which is structurally lower than the surface subject position. Thus, in order to derive the relevant interpretation, the sentential subject must be interpreted in a position lower than its surface position, as in (26). An additional argument that corroborates the conclusion above comes from the fact that if the base-generated position of a clausal complement is structurally higher than the base-generated position of a relevant QP, a bound variable reading is impossible, as shown in (27).

(27) *That a student from his$_i$ class cheated on the exam doesn't show [any professor]$_i$ that he$_i$ should conduct exams differently.

(cf., That the students cheated on the exam doesn't show [any professor]$_i$ that he$_i$ should conduct exams differently.)

The contrast between (23)–(25) and (27) indicates that the reconstruction effect in (23)–(25) is the same sort of phenomenon as the one observed in *wh*-movement (see (18) and (19) for relevant facts) and it also can be taken as evidence against the QR approach.

A reconstruction effect can also be observed in topicalization of a clausal complement, as illustrated in (28) and (29).[4]

[4]It is impossible for some speakers to apply overt Ā-movement to an indirect object in double object constructions (see den Dikken 1995, among others, for an analysis of this fact). However, as noted in

(28) a. [That some student from his$_i$ class cheated on the exam], I think (that) [every professor]$_i$ {brought out/raised}.

b. [That a student from his$_i$ class cheated on the exam], I don't think (that) [any professor]$_i$ {brought out/raised}.

(29) a. [That some student from his$_i$ class cheated on the exam], I think (that) [every professor]$_i$ gave serious consideration.

b. [That a student from his$_i$ class cheated on the exam], I don't think (that) [any professor]$_i$ gave serious consideration.

The presence of the reconstruction effect in the topicalization cases further corroborates the claim that a clausal complement can undergo movement in the cases under discussion.

Taken together, the facts discussed above constitute a serious challenge to a Koster-style analysis, which does not assume movement of a clausal complement.[5] However, once we accept the conclusion that a clausal complement can move, we are faced with the category mismatch puzzle again.[6] In the next section, I will propose an alternative solution to this puzzle.

4 Proposal

4.1 A covert Det approach

Given the facts discussed above, we are confronted with two questions that need to be addressed. The first question is why a movement dependency of a clausal complement must have properties that a movement dependency of a DP has. The second question is why a clausal complement in a non-derived position cannot be regarded as a DP. For expository purposes, I address only the first question in this section and defer dealing with the second question until the next section.

My answer to the first question is fairly simple. Whenever a clausal complement undergoes movement, it must be a DP.[7] More specifically, I argue that English has a

Hornstein and Weinberg (1981), not all speakers disallow Ā-movement of an indirect object. The availability of a reconstruction effect in (29) is relevant only to speakers who allow Ā-movement of an indirect object.

[5] If the presence of a reconstruction effect in a given construction should be taken as evidence for the presence of a relevant movement dependency in the construction, as assumed here, an analysis of *tough* constructions needs to be reconsidered. While *tough* constructions have widely been assumed to involve movement of a null operator, a reconstruction effect can be seen in this kind of constructions (Bayer 1990; cf. Epstein 1989). Further research needs to be done to construct an analysis of *tough* constructions that predicts the presence of a reconstruction effect.

[6] Webelhuth (1992) makes an attempt to solve the category mismatch puzzle by stipulating that movement of a clausal complement CP must leave behind a trace whose category is a DP. In the next section, I propose a principled way to accomplish a similar result.

[7] The idea that a clausal complement (sometimes or always) is a DP/NP has been proposed and advocated in diverse ways in the past literature (Davies and Dubinsky 1998, 1999, 2001; Delahunty 1983; Emonds 1976; Han 2005; Moulton 2008; Rosenbaum 1967; Weisler 1982, among others). Below, I discuss a crucial difference between the proposed approach and some of the existing ones.

covert definite determiner, which can take a clausal complement CP as its complement (see Elbourne 2001, 2005; Takahashi and Hulsey 2009, for independent arguments in favor of the existence of the covert definite Det in English). Thus, when a clausal complement appears to undergo overt movement on the surface, there are two possible derivations, namely, a derivation in which a clausal complement CP moves and a derivation in which a DP that consists of the covert definite Det and a clausal complement CP moves. I propose that only the second type of derivation (i.e., the derivation in which the structure of a clausal complement illustrated in (30) undergoes movement) is allowed, due to independent properties of the grammar.[8,9] (The covert definite Det is represented as THE in (30).)

(30) $[_{DP}$ THE $[_{CP} \ldots\ldots]]$

The structure in (30) receives initial support from the cross-linguistic fact that a Det, which I claim is covert in English, is realized overtly in various languages, some of which include Basque (Adger and Quer 2001), Modern Greek (Roussou 1991), and Persian (Farudi 2007). Facts from Modern Greek and Persian are presented in (31) and (32), respectively.[10]

(31) $[_{DP}$ to $[_{CP}$ oti ehis filus]] simeni (Modern Greek)
the-NOM that have-2SG friends-ACC mean-3SG
pola.
much
'That you have friends means a lot.' (Roussou 1991:78)

(32) $[_{DP}$ in $[_{CP}$ ke to u-rā da'vat na-kard-i]] mādar-at-ro (Persian)
this that you he-OBJ invitation NEG-did-2SG mother-2SG-OBJ
nārāhat kard.
upset did.3SG
'That you did not invite him made your mother upset.' (Farudi 2007:10)

Before presenting the rationale behind the necessity of the covert Det structure for a moved clausal complement, let me mention that the covert Det analysis straightforwardly accounts for the category mismatch puzzle in a way that also explains the reconstruction effect. Let us first consider the facts that have led to the Moved Clausal Complement Generalization, repeated here as (33).

[8]When the covert Det structure of a clausal complement appears in circumstances in which it must discharge a Case assigning property of a certain head, I assume that it is discharged by the covert Det under the assumption that CPs do not need Case. This view appears to be supported by the fact that the case morphology is realized on the Det in Modern Greek, which we will see shortly in (31).

[9]I assume that relevant clausal complements are of type ⟨s,t⟩ and can combine with the definite Det, which is of type $\langle\langle\alpha,t\rangle,\alpha\rangle$. See footnotes 11 and 14 for further discussion.

[10]As shown in (i), a bare CP clausal complement cannot appear in subject position in Persian.

(i) *$[_{CP}$ ke to u-rā da'vat na-kard-i] mādar-at-ro nārāhat kard. (Persian)
that you he-OBJ invitation NEG-did-2SG mother-2SG-OBJ upset did.3SG
'That you did not invite him made your mother upset.' (Farudi 2007:10)

This fact further corroborates the idea that a moved clausal complement must be a DP.

(33) **The Moved Clausal Complement Generalization**
A clausal complement is allowed to move only if its base-generated position is one in which a DP is allowed to appear.

We have seen that *hope*-class predicates do not allow a sentential subject and topicalization of a clausal complement, as in (34), but *capture*-class predicates do allow these constructions, as in (35).

(34) a. *That the Giants would win the World Series was reasoned by most baseball fans.
b. *That the Giants would probably win the World Series, most baseball fans reasoned.

(35) a. That these nouns behave differently is captured by this formulation of the rule.
b. That these consonants behave exceptionally, we can attribute to the fact that they are coronals.

The covert Det analysis explains these facts simply by making reference to independent complementation properties of predicates. Under the proposed approach, it is necessary to construct the structures in (36a) and (36b) in order to derive sentences like (34) and (35), respectively.

(36) a. *[*hope*-class V [$_{DP}$ THE [$_{CP}$ . . .]]]
b. [*capture*-class V [$_{DP}$ THE [$_{CP}$ . . .]]]

However, the structure in (36a) is illegitimate because *hope*-class predicates cannot take a DP complement, as evidenced by the ungrammaticality of (37a). On the other hand, there is no problem in the structure in (36b) because *capture*-class predicates can take a DP complement, as shown in (37b). Consequently, the contrast between (34) and (35) can be attributed to a difference in complementation properties between the two types of predicates.

(37) a. *Most baseball fans reasoned that.
b. This formulation of the rule captures the fact that these nouns behave differently.

Other facts discussed in Sect. 2 also follow from the covert Det analysis. As one can see, the proposed analysis can readily deal with the facts that appear to indicate that overt movement of a clausal complement bleeds the *[P CP] constraint, as in (38).

(38) a. That these nouns behave differently is accounted for by this assumption.
b. That Sonia attended the interview, I couldn't insist on.

The sentences in (38) are grammatical because the moved clausal complement is a DP and prepositions can take a DP as their complement. Moreover, under the covert Det approach, the fact that a parasitic gap is licensed by topicalization of a clausal complement can be considered as one instance of the general fact that a parasitic gap is licensed by overt Ā-extraction of a DP.

Finally, let us consider the reconstruction effects in the sentential subject construction in (39a) and in topicalization of a clausal complement in (39b), which was taken to be a challenge to a Koster-style analysis.

(39) a. [That a student from his$_i$ class cheated on the exam] doesn't seem to [any professor]$_i$ to be given serious consideration by the dean.

b. [That a student from his$_i$ class cheated on the exam], I don't think (that) [any professor]$_i$ gave serious consideration.

Under the proposed approach, there is a copy of the clausal complement, which contains the pronoun, in the c-command domain of the QP, as illustrated in (40). Thus, the independently motivated copy theoretic account of the reconstruction effect is applicable to these cases.

(40) [...[any professor]$_i$ ... [given/gave [$_{DP}$ THE [$_{CP}$ that a student from his$_i$ class cheated on the exam]] serious consideration]]

Let me now propose the rationale behind the requirement of the covert Det for a moved clausal complement. I argue that this requirement is not specific to a moved clausal complement. Instead, it is just one instantiation of a more general requirement. The general requirement that I propose is that whenever a constituent undergoes movement in syntax and establishes a dependency embodied in the LF representation, such a constituent must be headed by what I refer to as a D-type head, which includes Dets (e.g., *some*, *every*, and *which*), degree operators (e.g., *-er* and *how*), and temporal adverbs (e.g., *before* and *after*).[11] I claim that this structural requirement is ascribable to properties of an independently motivated mechanism for interpreting structures involving a syntactic movement dependency under the copy theory of movement, or Trace Conversion in (41), which is proposed by Fox (2002) (see also Elbourne 2005; Sauerland 1998, 2001, 2004).

(41) Trace Conversion
Variable Insertion: D (Pred) $\rightarrow$ D [(Pred) $\lambda y(y = x)$]
Determiner Replacement: D [(Pred) $\lambda y(y = x)$] $\rightarrow$ the [(Pred) $\lambda y(y = x)$]

(adapted from Fox 2002)

If a constituent undergoes movement that creates a chain in syntax, Trace Conversion must apply to copies that are not the head of the chain in order to convert the uninterpretable chain into a compositionally interpretable syntactic object. This point can be illustrated by examining cases like (42a). As it stands, (42a) involves type mismatch because the QP in object position, which is of type $\langle\langle e,t\rangle,t\rangle$, cannot

[11] A D-type head can semantically be characterized as an element of type $\langle\langle\alpha,t\rangle,\langle\langle\alpha,t\rangle,t\rangle\rangle$ or $\langle\langle\alpha,t\rangle,\alpha\rangle$ where α can range over individuals (type e), degrees (type d), times (type i) and worlds (type s). See Fox (2002), Takahashi (2006), and Takahashi and Hulsey (2009) for discussion about cases involving D-type heads that take constituents of type $\langle e,t\rangle$ as their complement (i.e., Dets), Bhatt and Pancheva (2004, 2007) for discussion about cases involving D-type heads that take constituents of type $\langle d,t\rangle$ as their complement (e.g., degree operators), and Takahashi (2008) for discussion about cases involving D-type heads that take constituents of type $\langle i,t\rangle$ as their complement (i.e., temporal adverbs). See footnote 14 for the idea that the covert Det structure for a moved clausal complement can be regarded as a case involving a D-type head that takes constituents of type $\langle s,t\rangle$ as its complement.

combine with a transitive predicate, which needs to first combine with a constituent of type e. While it has been widely assumed that the type mismatch is resolved by QR, which leaves an element of type e (see Heim and Kratzer 1998, among others), it is less clear how QR can solve the problem under the copy theory of movement because under this view, movement leaves a full-fledged copy of a moved element. Here, Trace Conversion plays a crucial role. As the first step, the object QP in (42a) undergoes QR, which leaves a full-fledged copy, as shown in (42b). (Following Heim and Kratzer 1998, I assume that movement induces insertion of a λ-operator right below a moved element.) Variable Insertion inserts a predicate $\lambda y.\ [y = x]$, which is of type ⟨e,t⟩ in this case, into the lower copy of the QP. This predicate and the restrictor of the Det (i.e., *book* in (42)) are combined by Heim and Kratzer's (1998) Predicate Modification, which results in the representation in (42c). Finally, Determiner Replacement replaces the Det in the lower copy (i.e., *every* in (42)) with the definite Det, as in (42d). Since the lower copy is now a definite description of type e, there is no type mismatch and the representation in (42d) can be compositionally interpreted in the semantic component.

(42) a. [John read every book]
→ QR
b. [[every book] λx. [John read [every book]]]
→ Variable Insertion
c. [[every book] λx. [John read [every book x]]]
→ Determiner Replacement
d. [[every book] λx. [John read [the book x]]]

Notice that Trace Conversion is applicable only when a moved constituent is a constituent headed by a D-type head (henceforth, a D-type constituent) because the existence of a D-type head is a prerequisite for the rule's application, as it is formulated in (41).[12] The upshot of the current discussion is that any syntactic movement of a non-D-type constituent ends up producing an uninterpretable structure. In effect, it amounts to saying that such a constituent cannot move in syntax.[13]

As mentioned above, when a clausal complement appears to undergo overt movement, there are in principle two options. The first option is to move a DP structure of a clausal complement, as in (43a).[14] The second option is to move a bare CP structure of a clausal complement, as in (43b).

[12]The reason why the presence of a predicate is optional in an application of Trace Conversion will become clear in Sect. 5.2 (see footnote 24). See Bhatt and Pancheva (2004, 2007), Takahashi (2006), and Takahashi and Hulsey (2009) for further discussion.

[13]There are cases where a non-D-type constituent appears to move. I will return to such cases in Sect. 6.2.

[14]It is widely assumed that predicates whose internal argument is a clausal complement take a proposition of type ⟨s,t⟩, as exemplified by the lexical entry of *believe* in (i) (Hintikka 1962; Kratzer 1977; cf., Kratzer 2006; Moulton 2007a, 2007b, 2008).

(i) [[believe]] = λp. λx. λw. ∀w'∈Dox(x)(w): p(w')

In order for this type of predicate to combine with a clausal complement that involves the covert definite Det, it is necessary to postulate another lexical entry, which allows it to take an object of type s as its first argument. I suggest that a clausal complement that is headed by the covert definite Det denotes a maximal plural world under the assumption that the maximality meaning is built into the meaning of the covert

(43) a. [[DP THE [CP . . . . .]] . . . [. . . V [DP THE [CP . . . . .]]]]
b. *[[CP . . . . .] . . . [. . . V [CP . . . . .]]]

The chain in (43a), which is created by movement of a DP, can be converted into an interpretable object by Trace Conversion in the way I illustrated above. In contrast, if a clausal complement CP undergoes syntactic movement, as in (43b), the output LF representation ends up being an uninterpretable structure because Trace Conversion is not applicable to the chain formed by movement of the CP. It follows from this that a clausal complement CP never moves in syntax and creates a chain embodied in the LF representation, from which we can derive the facts that appear to indicate that a moved clausal complement must show whatever properties DPs have (see also Moulton 2008 for a similar idea).

Before closing this section, let me point out one significant difference between the current proposal and the other approaches that adopt the idea that there exists a covert Det structure above a moved clausal complement CP. They crucially differ in what factor forces the covert Det to be present on top of a clausal complement CP. In the existing approaches, the requirement of the covert Det is often related to the EPP property of T, which requires that its specifier must be filled with a DP. Alternatively, it is linked to the Case related property that a certain type of head needs to assign Case and only DPs can receive Case. See Davies and Dubinsky (1998, 1999, 2001); Han (2005); Roussou (1991) for relevant discussion. However, this type of approach does not easily extend to deal with the fact that a clausal complement also must behave as if it is a DP when it undergoes topicalization. To make this point, let us consider the fact that topicalization of a clausal complement is not permitted if the relevant predicate belongs to the *hope*-class, as in (44).

(44) *That the Giants would probably win the World Series, most baseball fans reasoned.

We have taken the ungrammaticality of (44) as revealing that a trace left behind by topicalization of a clausal complement must have a DP status. Notice, however, that there is no obvious motivation that requires a Det structure to be posited for the clausal complement in (44) under the above-mentioned approaches. In the first place, there would not be a Case-based reason for the postulation of the covert Det in (44) because the clausal complement moves to a non-Case position. Moreover, the EPP property of T is not relevant, either, because the clausal complement does not move to the Spec of TP. Note that even if there is an EPP feature on the Topic head whose specifier the clausal complement moves to, it should be able to be satisfied by non-DP constituents because non-DP elements can be topicalized. Consequently, these

definite Det (see von Fintel et al. 2005; Fox and Hackl 2006, for relevant proposals about the overt definite Det). For instance, the constituent [THE [John cheated]] denotes the maximal plural world composed of worlds where John cheated. When *believe* combines with this kind of constituent, its lexical entry can be defined as (ii).

(ii) [[believe]] = $\lambda S_s.\ \lambda x.\ \lambda w.\ \forall w' \in Dox(x)(w)\colon w' \leq S$

I assume that other relevant predicates that take a clausal complement have a lexical entry along this line. I am grateful to Danny Fox for discussion about the semantics of clausal complement taking predicates.

approaches need to find a different factor that forces a Det structure for the clausal complement in (44). However, it is not clear what factor might accomplish this result.

In contrast, the current proposal, which relates the inevitability of the Det structure of a moved clausal complement to the properties of the procedure for interpreting structures involving a movement chain, is not confronted with this problem. Thus, I claim that the ungrammaticality of cases like (44) should be taken as an argument in favor of the current approach.

4.2 The cause of overt movement

In this section, I go into another question that was raised at the beginning of the last section, namely, the question of why non-moved clausal complements cannot be analyzed as DPs headed by the covert definite Det. More concretely, why can we not postulate the representations in (45b) and (46b) for the sentences in (45a) and (46a), respectively? If we could, we would incorrectly predict that English does not have *capture*-class predicates and the *[P CP] constraint. Note that the selectional properties of the relevant heads are satisfied by the covert Det structure of the clausal complement in (45b) and (46b).[15]

(45) a. *This formulation of the rule captures that these nouns behave differently.

b. [this formulation of the rule captures [$_{DP}$ THE [$_{CP}$ that these nouns behave differently]]]

(46) a. *I insisted on that Sonia attended the interview.

b. [I insisted [$_{PP}$ on [$_{DP}$ THE [$_{CP}$ that Sonia attended the interview]]]]

Given the covert Det analysis of the moved clausal complement in (47) and (48), I suggest that the illegitimacy of the derivations in (45b) and (46b) should be taken to indicate that overt movement of clausal complements is necessary for licensing the covert definite Det.[16]

(47) a. That these nouns behave differently is captured by this formulation of the rule.

b. [[$_{DP}$ THE [$_{CP}$ that these nouns behave differently]]$_1$ is [captured t_1 by this formulation of the rule]]

[15]Davies and Dubinsky (1998, 1999, 2001) argue that non-moved clausal complements can involve a covert DP structure under certain circumstances. Together with the fact that the covert Det structure is not available to clausal complements that appear in the complement of *capture*-class predicates and prepositions, their data, which are about the licensing of emphatic reflexives and plural adverbs, appear to suggest that non-moved clausal complements can be DPs when they appear in the complement of elements that can take both clausal and DP complements (e.g., *believe*). If this is a correct generalization, as far as I can tell, it does not follow from any existing analysis of clausal complements. I suggest that one possible approach to this issue is to explore an analysis that may account for Davies and Dubinsky's facts in a way that is compatible with the claim that non-moved clausal complements cannot be DPs.

[16]While I assume the copy theory of movement, I sometimes use traces as shorthand for indicating lower copies, just for ease of presentation.

(48) a. That these nouns behave differently is accounted for by this assumption.

b. [[$_{DP}$ THE [$_{CP}$ that these nouns behave differently]]$_1$ is [accounted for t_1 by this assumption]]

I suggest that this licensing requirement should be linked to the well-known fact that a sentential subject must occupy a position structurally higher than the Spec of TP, which is widely assumed to be the Spec of TopicP. This can be shown by the contrasts in the possibility of the subject-Aux inversion in (49) and in the compatibility with topicalization in (50) (see Alrenga 2005; Emonds 1976; Koster 1978; Kuno 1973; Ross 1967, among many others, for relevant facts).

(49) a. *Does that the Giants lost the World Series really suck?

b. Does the article that reported that the Giants lost the World Series really suck? (adapted from Alrenga 2005:177)

(50) a. *John, that the Giants lost the World Series shouldn't have bothered.

b. John, the fact that the Giants lost the World Series shouldn't have bothered. (Alrenga 2005:177)

Under the proposed analysis, this property of sentential subjects can be taken to indicate that the covert definite Det structure of a clausal complement is licensed only when it moves to the Spec of TopicP. Here, I present one possible way to implement this idea, which consists of two components. First, I assume that the covert definite Det that is attached to clausal complements involves an uninterpretable feature (uF), which must be checked off by the Topic head. Secondly, the Topic head is assumed to have an EPP feature. These two assumptions conspire to force overt movement of a clausal complement that involves the covert Det. As a result, the derivations in (45b) and (46b) are ruled out. The derivation posited for (47a) under this approach is given in (51).[17,18]

[17]Delahunty (1983), which was brought to my attention by one of the reviewers, presents some facts that appear to suggest that a sentential subject does not have to be in the Spec of TopicP. For instance, Delahunty argues that the subject-Aux inversion is possible even though the subject is a clausal complement, as shown in (i) (see also Han 2005; Weisler 1982, for relevant facts).

(i) a. Does that Fred lied to them bother all of the people who bought stock in his company?

b. Does that quarks have wings explain anything at all? (Delahunty 1983:387)

To the best of my knowledge, there has not been a characterization of factors that may distinguish (i) from (49a). If the contrast between (i) and (49a) results from idiolectal/dialectal variation in the syntactic position of a sentential subject, it is necessary to assume that for speakers who accept (i), the uF on the covert definite Det can be checked off by a head that is structurally lower than the Topic head (e.g., the T head).

[18]Landau (2007) proposes a novel theory of the EPP, where the EPP requires the specifier of a head with this property to be filled with a constituent whose head is phonologically overt. Landau argues that one supporting argument comes from the fact that a complementizer must be present if a clausal complement is preposed, as in (i) (Stowell 1981). Landau's theory captures this fact under the assumptions that the head whose specifier is occupied by the clausal complement in (i) has the EPP property and that the head of a clausal complement is a complementizer.

(51) [TopicP [DP THE~~[uF]~~ [CP that these nouns behave differently]]$_1$ Topic~~[EPP]~~ [TP t_1 is [$_{vP}$ captured t_1 by this formulation of the rule]]]

The claim that the covert Det structure of a clausal complement must move to the Spec of TopicP also offers a straightforward explanation of the fact that a sentential subject cannot appear in the ECM subject position, as shown in (52) (Alrenga 2005; Ross 1967; Stowell 1981; Webelhuth 1992, among others; cf., Delahunty 1983).

(52) *John believes that the cult members cloned a human baby to be true.
(cf., John believes their claim to be true.) (Alrenga 2005:185)

Notice that in (52), the clausal complement undergoes movement from its base-generated position to the Spec of the infinitival T, which requires it to be equipped with the covert definite Det. This in turn requires the Topic projection to be projected for licensing the covert definite Det. However, the Topic head cannot be projected in the infinitival complement clause of ECM predicates because such predicates cannot select a constituent bigger than a TP as their complement. Consequently, the *u*F on the covert definite Det remains unchecked, which makes cases like (52) ungrammatical.[19,20] As predicted by this analysis, if a clausal complement appears in the left

(i) a. *(That) the teacher was lying was hardly obvious.
b. *(That) Louise was angry at me came as no surprise.

Note that the proposed analysis of a clausal complement is incompatible with Landau's theory of the EPP because, as shown in (51), it is necessary to assume that the EPP property can be satisfied by a constituent whose head is phonologically covert (i.e., a clausal complement headed by a covert Det). Note also that the fact that a complementizer must be present in (i) does not immediately follow from the proposed analysis. The relevance of Landau (2007) to the current topic was pointed out by Marcel den Dikken.

[19]The same type of explanation is applicable to the fact that a sentential subject is not allowed to appear in embedded clauses of a certain kind (Alrenga 2005; Emonds 1976; Koster 1978). For example, it is illegitimate in the complement clause of adverbial adjuncts, as shown in (i).

(i) *Although that the house is empty may depress you, it pleases me.
(cf., Although the house's emptiness depresses you, it pleases me.) (Koster 1978:54)

As suggested by the ungrammaticality of topicalization in (ii), the Topic head cannot be projected in embedded clauses of this sort.

(ii) ?*Although Mary, this may depress, it pleases me. (Alrenga 2005:179)

Thus, the licensing condition on the covert definite Det cannot be satisfied under such circumstances.

[20]Note that interrogative clausal complements can appear in the ECM subject position, as pointed out by one of the reviewers:

(i) John believes whether the cult cloned a baby to be unknown.

Together with the fact that unlike non-interrogative clausal complements, interrogative clausal complements can occupy the complement of a preposition, as in (ii), this fact appears to indicate two structural properties of interrogative clausal complements.

(ii) John raised the question of whether Mary's theory is correct.

First, both moved and non-moved interrogative clausal complements should be analyzed as having a DP structure. Secondly, they do not involve the *u*F, which must be checked off by the Topic head, unlike the covert Det structure of non-interrogative clausal complements. A detailed investigation of the syntax of interrogative clausal complements is left for future research.

peripheral position in the matrix clause as a result of additional applications of movement, its gap can be in the ECM subject position, as shown in (53) (Alrenga 2005; Kuno 1973; Webelhuth 1992).[21]

(53) a. That the cult members cloned a human baby is believed to be true.
b. That the Giants will win the World Series, I believe to be obvious.
(Alrenga 2005:185, 192)

Since derivations where the clausal complement moves to the Spec of TopicP can be postulated for the sentences in (53), unlike (52), they are grammatical.[22]

To sum up: in this section, I addressed the question of why a clausal complement in a non-derived position cannot be parsed as a DP headed by the covert definite Det. I argued that the unavailability of the covert definite Det in non-movement environments can be attributed to the properties of the licensing condition on the covert Det. More specifically, the covert Det is licensed only if it moves to the Spec of TopicP. We have seen that this licensing condition has a consequence for the analysis of the fact that a clausal complement cannot remain in the ECM subject position.

5 A further argument: an anti-reconstruction effect

5.1 The (anti-)reconstruction puzzle

In this section, I present further evidence for the claim that there exists a covert Det structure in a moved clausal complement. An additional argument is made on the basis of a fact that is, at first sight, puzzling from the perspective of the copy theory of movement, namely, the fact that a violation of Condition C is circumvented by movement of a clausal complement if a relevant name is within the moved clausal complement (see also Moulton 2008 for relevant facts). This is shown in (54).

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[21] A reconstruction effect can also be observed in the cases under discussion.

(i) a. [That some student from his_i class cheated on the exam], I think (that) [every professor]$_i$ believes to be true.
b. [That a student from his_i class cheated on the exam], I don't think (that) [any professor]$_i$ believes to be true.

This fact shows that the clausal complement actually moves from the ECM subject position.

[22] A clausal complement cannot occupy the subject position in a small clause, as in (ia). However, as shown in (ib), a gap created by movement of a clausal complement is compatible with this position, just like the ECM cases.

(i) a. *Many people now consider that the Giants will win the World Series unlikely.
b. That the Giants will win the World Series is now considered unlikely. (Alrenga 2005:185)

The explanation that I just proposed for the ECM cases can be extended to the small clause cases under the assumption that the small clausal subject undergoes movement to the matrix clause (see Johnson 2004, for supporting evidence).

(54) a. [That John$_i$'s sister cheated on the exam] seems to him$_i$ to be captured by this document.

b. [That John$_i$'s sister cheated on the exam], he$_i$ believes to be untrue.

The obviation of a Condition C violation in (54) appears to indicate that movement of a clausal complement can optionally leave a lexically impoverished syntactic object (i.e, a trace), as in (55a). If it always leaves a full-fledged copy of a moved element, as in (55b), Condition C would not be obviated in (54).

(55) a. [[that John$_i$'s sister cheated on the exam]$_1$ seems to him$_i$ to be captured t_1 by this document]

b. *[[that John$_i$'s sister cheated on the exam]$_1$ seems to him$_i$ to be captured [that John$_i$'s sister cheated on the exam]$_1$ by this document]

On the other hand, we have already seen that the reconstruction effect is exhibited by movement of this sort, which points to the conclusion that it can also leave a lexically contentful copy, as in (55b). The relevant facts are repeated here as (56) and (57).

(56) [That a student from his$_i$ class cheated on the exam] doesn't seem to [any professor]$_i$ to be captured by this document.

(57) [That a student from his$_i$ class cheated on the exam], I don't think (that) [any professor]$_i$ {brought out/raised}.

Taken together, the facts above demonstrate that movement of a clausal complement *optionally* leaves a copy. As it stands, this property of movement does not straightforwardly follow from any existing theory of movement (i.e., the trace theory and the copy theory of movement). Below, I argue that the Condition C bleeding effect in (54) can be explained by an independently motivated theory of counter-cyclic merger in a way compatible with the copy theory of movement. However, this is possible only if we adopt the covert Det analysis of moved clausal complements. Since I am not aware of any obvious alternative approach that captures both the presence of the reconstruction effect and the absence of the Condition C violation effect in a principled way, I claim that the obviation of a Condition C violation in (54) should be taken as evidence for the proposed analysis.

5.2 Introducing Wholesale Late Merger

To set the stage for making a further argument for the proposed analysis, I introduce a particular theory of counter-cyclic merger that I developed in Takahashi (2006) (see also Takahashi 2008; Takahashi and Hulsey 2009, for additional evidence).

It has been claimed that Ā-movement does not bleed Condition C if a relevant name is within the complement of a moved phrase, as shown in (58) (Chomsky 1993; Fox 1999; Freidin 1986; Lebeaux 1988, 1998; van Riemsdijk and Williams 1981).[23]

[23]This claim has sometimes been challenged in the past literature (see Jacobson 2004; Kuno 2004; Lasnik 1998, 1999; McCarthy 2003). However, we can make the same point on the basis of facts about covert Ā-movement (i.e., QR), as in (i). The judgment on (i) is more robust:

(i) *A different person told him$_i$ about every argument that John$_i$ is a genius. (Fox 1999:192)

See also Safir (1999) for relevant facts and discussion.

(58) a. ??/*[Which argument [that John$_i$ is a genius]] did he$_i$ believe?
(Fox 1999:164)

b. *[Which report [that John$_i$ was incompetent]] did he$_i$ submit?
(Freidin 1986:179)

As Chomsky (1993) discusses, this reconstruction effect is naturally explained by the copy theory of movement. Under this theory of movement, the sentence in (58a) is analyzed as involving the representation in (59). In (59), the name in the lower copy is c-commanded by the co-referential pronoun, which induces a violation of Condition C.

(59) *[$_{CP}$ [which argument that John$_i$ is a genius] did [$_{TP}$ he$_i$ believe [which argument that John$_i$ is a genius]]]

While the fact in (58) can be taken as indicating that Ā-movement obligatorily leaves a full-fledged copy of a moved element, it has also been pointed out that Ā-movement does bleed Condition C if a relevant name is within an *adjunct* of a moved phrase, which could be a potential challenge to the copy-theoretic account of (58):

(60) a. [Which argument [that John$_i$ made]] did he$_i$ believe? (Fox 1999:164)

b. [Which report [that John$_i$ revised]] did he$_i$ submit?
(Freidin 1986:179)

Capitalizing on Lebeaux's (1988) idea that adjuncts can be introduced into a structure counter-cyclically (henceforth, Late Merger), Chomsky (1993) argues that the Condition C bleeding effect in (60) can indeed be explained in a way compatible with the copy theory of movement and postulates the derivation in (61) for (60a). Notice that since the adjunct that contains the name is merged with the *wh*-phrase after it undergoes movement to the Spec of CP in (61c), there is no occurrence of the name in the c-command domain of the pronoun.

(61) a. [$_{TP}$ he$_i$ believe [which argument]]
→ *wh*-movement

b. [$_{CP}$ [which argument] did [$_{TP}$ he$_i$ believe [which argument]]]
→ Late Merger

c. [$_{CP}$ [which argument [that John$_i$ made]] did [$_{TP}$ he$_i$ believe [which argument]]]

Lebeaux claims that counter-cyclic merger of arguments is not feasible because it violates Chomsky's (1981) Projection Principle, which requires the subcategorization property of lexical items to be satisfied throughout the derivation. Therefore, we cannot posit an analogous derivation to (61) for (58), which correctly predicts the absence of the Condition C bleeding effect in (58).

Given this explanation of the argument-adjunct asymmetry, it is, however, puzzling that A-movement bleeds Condition C even when a relevant name is inside an argument of a moved phrase, as shown in (62).

(62) a. [The claim [that John$_i$ was asleep]] seems to him$_i$ to be correct.
(Chomsky 1993:37)

b. [Every argument [that John$_i$ is a genius]] seems to him$_i$ to be flawless.
(Fox 1999:192)

It is clear that we cannot resort to Late Merger of the argument of the moved element in order to account for the Condition C bleeding effect in (62). Together with the fact that A-movement shows a reconstruction effect, as in (63), the fact in (62) appears to indicate that A-movement optionally leaves a copy, which is the characteristic property shared with movement of a clausal complement.

(63) [Someone from his$_i$ class] seems to [every professor]$_i$ to be a genius.
(Fox 1999:161)

On the basis of the asymmetry between A-movement and Ā-movement, I developed a particular theory of Late Merger in Takahashi (2006). Capitalizing on Fox's (2002) idea that Late Merger is applicable only if the resulting representation is interpretable, I proposed that the restrictor of a Det can be merged with the Det countercyclically (Wholesale Late Merger, or WLM) and that WLM gives the means to explain the above-mentioned property of A-movement under the copy theory of movement. In cases in which a Condition C violation appears to be circumvented, as in (62), only a Det is introduced in the base structure in (64a) and it moves successive-cyclically in (64b). When the Det moves to a position outside of the c-command domain of the pronoun, the restrictor of the Det WLM-s with the Det, as in (64c). Finally, Trace Conversion converts the lower copies of the Det into interpretable syntactic objects by supplying a predicate, which functions as a restrictor, to the lower copies and replacing the quantificational Det with the definite Det.[24] The resulting syntactic objects (i.e., *the x* and *the y* in (64d)) receive the same semantic interpretation as that assigned to syntactic objects which are traditionally called traces. As is clear from the output representation in (64d), Condition C is not violated because there is no copy of the name that is c-commanded by the pronoun. Notice also that all movements involved in (64) leave a full-fledged copy of a moved element, consistent with the copy theory of movement.

(64) a. [[every] flawless]
→ successive cyclic movement of a Det

b. [[every] seems to him$_i$ [[every] to be [[every] flawless]]]
→ WLM

c. [[every [argument that John$_i$ is a genius]] seems to him$_i$ [[every] to be [[every] flawless]]]
→ Trace Conversion

d. [[every [argument that John$_i$ is a genius]] λx. seems to him$_i$ [[the x] λy. to be [[the y] flawless]]]

[24]Trace Conversion is applicable to the copies of the Det in (64c) because the existence of a restrictor of a Det is not a prerequisite for an application of Trace Conversion, as formulated in (41).

This approach can easily handle the reconstruction effect exhibited by A-movement. Since an application of WLM is optional, the restrictor of a Det can be introduced into the base structure. Therefore, we can postulate the derivation in (65) for (63), which correctly contains a copy that contributes to producing the bound variable reading.

(65) a. [[someone from his_i class] a genius]
→ successive cyclic movement of a DP

b. [[someone from his_i class] seems to [every professor]$_i$ [[someone from his_i class] to be [[someone from his_i class] a genius]]]

Notice that if WLM can take place in the derivation of cases involving Ā-movement like (66a), we incorrectly predict that Ā-movement also always bleeds Condition C, as illustrated in (66b–d).

(66) a. ??/*[Which argument [that $John_i$ is a genius]] did he_i believe?

b. [$_{CP}$ [which] λx. did [$_{TP}$ he believe [which]]]
→ WLM

c. [$_{CP}$ [which [$_{NP}$ argument that John is a genius]] λx. did [$_{TP}$ he believe [which]]]
→ Trace Conversion

d. [$_{CP}$ [which [$_{NP}$ argument that John is a genius]] λx. did [$_{TP}$ he believe [the x]]]

In Takahashi (2006), I argued that the derivation in (66) is ruled out by the interaction of two properties of the Case assignment mechanism. The relevant properties are that a head can only assign Case to an element in its c-command domain and that a noun head needs to receive Case. Given these, WLM in (66) is blocked because the restrictor NP is introduced outside of the c-command domain of the relevant Case assigner (i.e., *v* in (66)) and the counter-cyclically merged noun head cannot obtain Case.[25] Since only the derivation in (67) can be posited for (66a), a violation of Condition C is inevitable in this case.[26]

[25]To explain the distinct behaviors of A-movement and Ā-movement, Lebeaux (1998) and Sauerland (1998) propose ideas that can be viewed as predecessors of the WLM approach (see Takahashi and Hulsey 2009, for further relevant discussion). In addition, attributing the observation to Uli Sauerland, Fox (2002:fn. 11) suggests that his approach predicts that WLM should be possible. However, Fox assumes that such an operation is prohibited by a locality constraint. Finally, Bhatt and Pancheva (2004:fn. 33) also point out the possibility of WLM and the idea that it is disallowed in Ā-movement contexts by Case-related considerations. However, Bhatt and Pancheva do not investigate facts about A-movement from this perspective.

[26]Counter-cyclic merger of the complement of a noun head (i.e., *that $John_i$ is a genius* in (66a)), which could be another way to circumvent a Condition C violation, is also prohibited, because counter-cyclic merger of this sort always ends up yielding an uninterpretable structure. In contrast, counter-cyclic merger of an adjunct is possible because structures that are derived by such an operation are interpretable. See Fox (2002) for detailed discussion.

(67) a. [$_{vP}$ ***v*** believe [which [$_{NP}$ argument that John$_i$ is a genius]]]
→ *wh*-movement

b. [$_{CP}$ [which [$_{NP}$ argument that John$_i$ is a genius]] did [$_{TP}$ he$_i$ [$_{vP}$ ***v*** believe [which [$_{NP}$ argument that John$_i$ is a genius]]]]]

In A-movement cases like the one illustrated in (64), WLM is exercised when the Det moves to the matrix VP-adjoined position, which is above the pronoun, but is still below the relevant Case assigner, T, as shown in (68):[27]

(68) a. [Every argument that John$_i$ is a genius] seems to him$_i$ to be flawless.

b. [$_{TP}$ **T** [$_{VP}$ [every [$_{NP}$ argument that John$_i$ is a genius]] [$_{VP}$ seems to him$_i$ [[every] to be [[every] flawless]]]]]

In the next section, I will demonstrate that together with the covert Det analysis of moved clausal complements, the WLM approach provides a straightforward account of the facts about movement of a clausal complement discussed in the previous section.

5.3 A WLM approach to the (anti-)reconstruction puzzle

We are now ready to return to the facts about movement of a clausal complement, which led us to the puzzling conclusion that movement of this sort optionally leaves a full-fledged copy. As we can see from the discussion above, this is no longer the necessary conclusion under the WLM approach. If a moved clausal complement involves a covert definite Det, this approach explains this movement property in the same way as the property of A-movement. The detailed derivations which it postulates for the Condition C bleeding case in (69a) and the reconstruction effect case in (70a) are illustrated in (69b–d) and (70b–c), respectively.[28]

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[27] The proposed account of the contrast between A-movement and Ā-movement predicts that if a restrictor of a Det is a constituent that does not need Case, Ā-movement of such a constituent also bleeds Condition C. See Takahashi (2008) and Takahashi and Hulsey (2009) for the claim that this prediction is borne out. See also footnote 28 for relevant discussion.

[28] We have seen that Ā-movement of a DP does not bleed Condition C if a relevant name is within an argument of a moved DP. However, a violation of Condition C is circumvented by Ā-movement of a clausal complement in (54b), which is repeated here as (i).

(i) [That John$_i$'s sister cheated on the exam], he$_i$ believes to be untrue.

I argue that WLM is feasible in (i), as illustrated in (ii), because the complement of the covert definite Det is a CP, which does not need Case, and an application of WLM is not restricted by Case considerations, unlike in the derivation in (67) postulated for the Ā-movement case in (66a).

(ii) [[THE [$_{CP}$ that John$_i$'s sister cheated on the exam]] [he$_i$ believes to be [THE] untrue]]

See footnote 27 for relevant discussion.

(69) a. [That John$_i$'s sister cheated on the exam] seems to him$_i$ to be captured by this document.

b. [captured [THE] by this document]

→ successive cyclic movement of a Det

c. [[THE] seems to him$_i$ to be [captured [THE] by this document]]

→ WLM

d. [[THE [that John$_i$'s sister cheated on the exam]] seems to him$_i$ to be [captured [THE] by this document]]

(70) a. [That some student from his$_i$ class cheated on the exam] seems to [every professor]$_i$ to be captured by this document.

b. [captured [THE [that some student from his$_i$ class cheated on the exam]] by this document]

→ successive cyclic movement of a DP

c. [[THE [that some student from his$_i$ class cheated on the exam]] seems to [every professor]$_i$ to be [captured [THE [that some student from his$_i$ class cheated on the exam]] by this document]]

This analysis of the Condition C bleeding and the reconstruction effects is further corroborated by the fact that scope reconstruction feeds Condition C in movement of a clausal complement, which was pointed out by Kyle Johnson (p.c.). This is illustrated in (71a).

(71) a. *That a student from his$_i$ class cheated in John$_j$'s exam seems to him$_j$ to have not been given serious consideration by [any professor]$_i$.

b. That a student from his$_i$ class cheated in his$_j$ exam seems to John$_j$ to have not been given serious consideration by [any professor]$_i$.

In order for the pronoun *his* to be bound by the QP *any professor* in (71a), the clausal complement CP is required to be base-generated in the complement of *given*, together with the covert definite Det. However, in order to circumvent a Condition C violation, only the covert definite Det has to be generated in that position and the clausal complement CP must be WLM-ed with the Det when it moves outside of the c-command domain of the pronoun. It is clearly impossible to satisfy these two conflicting requirements imposed on the timing of the merger of the clausal complement CP in a single derivation. Therefore, (71a) is ungrammatical. Note that if the positions of the name and the coreferential pronoun are switched, as in (71b), the sentence becomes grammatical. This is also expected because in this case, the clausal complement CP can be introduced in the complement of *given*, together with the covert Det, without violating Condition C.[29]

[29] As discussed in Fox (1999, 2000), Romero (1998), and Sportiche (2005, 2006), scope reconstruction also feeds Condition C in movement of a DP, as shown in (i).

(i) a. [A student of David$_i$'s] seems to him$_i$ to be at the party.
(∃ > seem) *(seem>∃)

b. [A student of his$_i$] seems to David$_i$ to be at the party.
(∃ > seem) (seem>∃) (Fox 1999:197)

We have seen above that the Condition C bleeding effect exhibited by movement of a clausal complement is straightforwardly explained by the independently supported WLM approach, together with the covert Det analysis. I have argued that the fact that movement of a clausal complement not only obviates a violation of Condition C, but also shows a reconstruction effect, is otherwise puzzling. Moreover, the WLM approach is applicable only under the covert Det analysis. Consequently, I suggest that the obviation of Condition C violations should be taken as a further argument in favor of the proposed analysis of clausal complements.

6 Some implications

6.1 The distribution of clausal complements

It is well known that clausal complements show different distributional properties from other complements, especially DP complements. Various facts have been pointed out in the literature which appear to show that clausal complements cannot reside in the canonical subject and object positions that DP complements can occupy (see Emonds 1976; Stowell 1981, among many others). We have already seen the facts that motivate the conclusion that clausal complements cannot stay in the canonical subject position. The relevant facts are repeated here as the contrast between (72) and (73). I have argued that this distributional property should be linked to the requirement for licensing the covert definite Det of a moved clausal complement.

(72) a. *Does that the Giants lost the World Series really suck?
b. *John, that the Giants lost the World Series shouldn't have bothered.

(73) a. Does the article that reported that the Giants lost the World Series really suck?
b. John, the fact that the Giants lost the World Series shouldn't have bothered.

One representative set of facts that supports the conclusion that clausal complements cannot stay in the canonical object position is illustrated in (74)–(76). Unlike DP complements, clausal complements cannot precede other complements or modifiers, as shown by the contrast between (74) and (75).[30] Instead, they need to follow these elements, as in (76). It is this distributional property of clausal complements that I explore in this section. I suggest below that the covert Det approach has an implication for an analysis of the facts in (74) and (76).

The analysis that I just proposed for (71) carries over to this fact. See Takahashi (2006) and Takahashi and Hulsey (2009) for details.

[30]Some speakers, including one of the reviewers, found (74b) better than (74a) (see also Alrenga 2005, for relevant facts). See footnote 31 for one possible approach to this fact.

(74) a. ?*Mary said [that she wanted to drive] quickly.
b. ?*Paul mentioned [that his shirt was dirty] to Bill.
c. ?*John knew [that the law was unfair] from experience.
(Stowell 1981:161)

(75) a. Mary said [his name] quickly.
b. Paul mentioned [that rumor] to Bill.
c. John knew [the answer] from experience.

(76) a. Mary said quickly [that she wanted to drive].
b. Paul mentioned to Bill [that his shirt was dirty].
c. John knew from experience [that the law was unfair].
(Stowell 1981:161)

An influential analysis of the distribution of complements can be found in Stowell (1981). Stowell proposes that the crucial force that determines possible structural positions of clausal complements is the Case-Resistance Principle, which, together with other properties of the grammar (e.g., Case Theory and θ-Theory), delivers the result that tensed clausal complements must occupy a Case-marked position at some point of the derivation, but are obliged to evacuate that position at S-structure (i.e., before Spell-out in current terminology). Stowell also argues that obligatory movement from a Case-marked position is not required for DP complements, which explains the distributional differences between the two categories. Under this approach, the sentences in (76) are parsed as involving rightward movement of the clausal complement CP from the Case-marked position where the DP complement appears in (75).

The proposed explanation of the fact that clausal complements cannot appear in the canonical subject position is virtually the same as Stowell's analysis in the sense that a clausal complement is required to undergo movement from the Spec of TP (i.e., a Case-marked position) by some factor. However, I suggest that the distributional property of clausal complements illustrated in (74)–(76) should not be attributed to the obligatory rightward movement of clausal complements. Instead, it should be taken as indicating that clausal complements must be base-generated in the lowest position within a predicate phrase. Under this approach, the word order observed in (76) can be taken to reflect the base-generated position of the clausal complements. It is impossible to derive (74) by applying leftward movement to the clausal complements in the structure postulated for (76) because as discussed in Sect. 4.2, the covert Det of a moved clausal complement cannot be licensed in a clause-medial position, as in (74).[31]

[31] As mentioned in footnote 30, there are speakers who find (74b) better than (74a). I speculate that for those speakers, it is possible to apply rightward movement to a PP element, but not to an adverbial element. However, one of the reviewers pointed out that when an adverbial element is not lighter than a clausal complement, it can follow the clausal complement. This observation may be taken as suggesting that an application of rightward movement to an adverbial element is dependent upon the phonological weight of the adverbial element.

An argument in favor of this non-movement approach comes from a violation of Condition C in (77).[32]

(77) a. *I will tell him$_i$ tomorrow [that John$_i$'s sister cheated on the exam].

b. *I will show him$_i$ tomorrow [that John$_i$'s theory is incorrect].

This fact follows straightforwardly from the non-movement approach because the pronoun is structurally higher than the clausal complement and hence, binds into it. In contrast, if we adopt the rightward movement analysis, it is less obvious why Condition C is violated in (77). Recall that we have seen that leftward movement of a clausal complement bleeds Condition C, as in (78a), and I argued that this fact was captured by making use of the counter-cyclic merger of the clausal complement CP, as illustrated in (78b).

(78) a. [That John$_i$'s sister cheated on the exam], he$_i$ believes to be untrue.

b. [[THE [$_{CP}$ that John$_i$'s sister cheated on the exam]] [he$_i$ believes [[THE] to be [[THE] untrue]]]]

Given this, if the sentences in (76) are derived by rightward movement of the clausal complement, I do not see any reason why we cannot postulate for (77) the same type of derivation in which the clausal complement CP is counter-cyclically merged with the rightward moved Det, as in (79).[33]

(79) a. [[I will tell him$_i$ [THE]] tomorrow]
→ rightward movement of a Det

b. [[[I will tell him$_i$ [THE]] tomorrow] [THE]]
→ WLM

c. [[[I will tell him$_i$ [THE]] tomorrow] [THE [that John$_i$'s sister cheated on the exam]]]

It is clear that this derivation would yield the undesired result that Condition C is not violated in (77). Under the present proposal, these facts lend support to a non-movement approach.[34,35]

[32]One of the reviewers pointed out that if a name is not c-commanded by a co-referential pronoun, Condition C is not violated:

(i) I will tell [a friend of his$_i$] tomorrow [that John$_i$'s sister cheated on the exam].

[33]In Sect. 4.2, I argued that the covert Det is licensed only when it moves to the Spec of TopicP. In the derivation in (79), I assume that the covert Det undergoes rightward movement to a position in which it can be licensed. I am grateful to Annahita Farudi for discussion about this point.

6.2 Movement of non-D-type constituents

I have argued that there is a general requirement that if an element moves in syntax and creates a dependency embodied in the LF representation, it must be a D-type constituent. Otherwise, Trace Conversion cannot convert an uninterpretable chain into an interpretable syntactic object. Given this proposal, it is expected that a non-D-type constituent should not be able to form a chain that is interpretable at LF, even when it appears to move. In this section, I suggest that this expectation is fulfilled on the basis of facts from topicalization of predicate phrases and also discuss its ramifications for the analysis of moved clausal complements.

Topicalization of a predicate phrase, which is exemplified in (80), can be regarded as a representative case in which an overtly dislocated constituent is not a D-type constituent.

(80) a. [Criticize John], I think Mary did.
b. [Proud of John], I think Mary is.

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[34]The non-movement analysis also fits well with the fact that a clausal complement of *hope*-class predicates can follow adverbial elements, as in (i).

(i) a. John insisted (yesterday) [that the Giants would win the World Series].
b. We hope (sincerely) [that the Giants will win the World Series].

If the sentences in (i) were derived by rightward movement of the clausal complement, they should be ruled out on a par with (ii), contrary to fact.

(ii) a. *That the Giants would win the World Series was {hoped/insisted} by most baseball fans.
b. *That the Giants would probably win the World Series, (I think that) most baseball fans reasoned.

However, it remains puzzling under the non-movement approach why there is a contrast in grammaticality between (iiia) and (iiib). Since the clausal complement remains in situ in both cases under this approach, we expect them to uniformly be ungrammatical.

(iii) a. *This formulation of the rule {captures/expresses} that these nouns behave differently.
b. ?This formulation of the rule {captures/expresses} straightforwardly that these nouns behave differently.
c. That these consonants behave exceptionally, we can attribute to the fact that they are coronals.

The fact that (iiib) is marginally acceptable appears to suggest that the clausal complement in (iiib) undergoes movement, just as in (iiic). Consequently, the contrast between (iiia) and (iiib) appears to pose a challenge to the non-movement approach. Note, however, that while the rightward movement approach may be able to capture the fact in (iiib), it would be confronted with a different problem, namely, the problem of why the sentences in (i) are in a striking contrast to (ii).

[35]As discussed in Sect. 2.1, a clausal complement cannot occupy the indirect object position in the double object construction, as in (ia). However, if a proleptic *it* is inserted into this position, the sentence becomes grammatical, as in (ib).

(i) a. *John gave [that Mary had done this] no further thought.
b. John gave it no further thought [that Mary had done this].

It remains to be seen whether cases like (ib) involve rightward movement of a clausal complement.

If the LF representation of (80) must embody the chain established by movement of the predicate phrase, as in (81), topicalization of a predicate phrase would be predicted to be ungrammatical because (81) contains the uninterpretable chain that Trace Conversion is not applicable to.

(81) [[criticize John] [I think Mary did [criticize John]]]

However, it has been claimed that topicalization of a predicate phrase does not generate a syntactic chain of the kind illustrated in (81) (Heycock 1995; Takano 1995). If it could produce such a chain, one would expect there to be a situation in which a copy of a topicalized predicate phrase receives an interpretation in a derived position. Contrary to this expectation, the generalization that has been drawn in the past literature is that a topicalized predicate phrase must be interpreted in its original position as if it had not undergone overt movement (Heycock 1995; Huang 1993; Takano 1995). In other words, no element of a moved predicate phrase is interpreted in a derived position, unlike $\bar{A}$-movement of DPs, in which at least an operator/determiner of a moved DP always gets interpreted in a derived position (see Sauerland and Elbourne 2002, for detailed discussion). Within Heim and Kratzer's (1998) framework, this means that movement of a predicate phrase does not induce insertion of a λ-operator right below a moved element. Movement that has this property, which is sometimes called total or radical reconstruction, will be referred to as *semantically vacuous movement*. One well-known argument for this claim comes from the fact that topicalization of a predicate phrase cannot circumvent a violation of Condition C, as shown in (82).[36]

(82) a. *[Criticize John$_i$], I think he$_i$ said Mary did.
b. *[Proud of John$_i$], I think he$_i$ said Mary is. (Takano 1995:331)

One possible account of the fact that topicalization of a predicate phrase is semantically vacuous, which I adopt here for concreteness, is proposed by Takano (1995) (see Heycock 1995; Sauerland and Elbourne 2002, for alternative approaches). Takano argues that while a predicate phrase undergoes movement in syntax, every occurrence of the moved predicate phrase but the one in the original position is required to be deleted at LF by independent properties of the grammar, as shown in (83) (see Takano 1995, for discussion about a rationale behind this requirement).

(83) [~~[criticize John]~~ [I think Mary did [criticize John]]]

Notice that an analysis of topicalization of a predicate phrase along this line is compatible with the proposed framework, in which only D-type constituents can form a movement chain that is embodied in the LF representation. Furthermore, we can

[36]The fact that movement of a predicate phrase shows a reconstruction effect, which was pointed out by one of the reviewers, is compatible with the idea that a moved predicate phrase must get interpreted in its base-generated position:

(i) [Proud of her$_i$ son] though [every mother]$_i$ is, no mother will willingly exaggerate their son's achievements.

now correctly predict that topicalization of a predicate phrase is grammatical because in the LF representation in (83), there is no chain created by movement of a non-D-type constituent which Trace Conversion needs to apply to and moreover, the LF representation in (83) is interpretable in the semantic component.

An additional fact that corroborates the claim that topicalization of a predicate phrase does not form a movement chain comes from the fact that topicalization of a predicate phrase lacks the Condition C bleeding effect that topicalization of a DP displays when a relevant name is within an adjunct of a moved element. This point can be made by the contrast between (84) and (85).

(84) a. [The students [that John$_i$ taught]], he$_i$ said Mary criticized.
b. [The pictures of the girl [that John$_i$ loves]], he$_i$ said Mary likes.
(Takano 1995:331)

(85) a. *[Criticize a student [that John$_i$ taught]], he$_i$ said Mary did.
b. *[Proud of a student [that John$_i$ taught]], he$_i$ said Mary is.
(Takano 1995:332)

As we have seen above, a violation of Condition C can be circumvented in (84) because an adjunct can be counter-cyclically merged with a topicalized DP after it moves out of the c-command domain of a pronoun, as in (86a). As one can see in (86a), counter-cyclic merger is possible only when a moved element can be interpreted in a derived position. Given this, the absence of the Condition C bleeding effect in (85) appears to indicate that it is impossible to assign the representation in (86b), where two copies are interpreted, to topicalization in (85a), which in turn can be taken to mean that topicalization of a predicate phrase cannot establish a syntactic chain that movement of a DP usually produces.[37]

(86) a. [[the students [that John$_i$ taught]] [he$_i$ said Mary criticized [the students]]]
b. *[[criticize a student [that John$_i$ taught]] [he$_i$ said Mary did [criticize a student]]]

[37]Movement that involves a pied-piped preposition, as in (i), could be considered another case where a non-D-type constituent appears to move.

(i) To which student did you give that book?

Furthermore, structures involving movement of a PP show a reconstruction effect the same way as structures involving movement of a DP, as pointed out by Marcel den Dikken. The fact that the antecedent of the reflexive anaphor is ambiguous in (iia) as well as (iib) suggests that the DP *pictures of himself* can be interpreted in a derived position where the matrix subject can be an antecedent of the reflexive anaphor.

(ii) a. [About pictures of himself$_{i/j}$], John$_i$ thinks that Bill$_j$ would never talk.
b. [Pictures of himself$_{i/j}$], John$_i$ thinks that Bill$_j$ would never talk about.

However, as far as I can tell, there is no evidence that indicates that a pied-piped preposition is interpreted in a derived position. Instead, it appears that it is always interpreted in its original position. Thus, I assume that cases involving movement of a PP like (i) and (iia) embody the same movement dependency as the one formed by movement of a D-type constituent (e.g., a DP) and that independent properties of the grammar allow us to pronounce a preposition in a derived position.

While we have seen that topicalization of a predicate phrase exhibits some characteristic properties that movement of D-type constituents does not, it is subject to island constraints, just like other types of movement. This is shown in (87).

(87) a. *They all argued that Bill would leave the country, and [leave the country] I resent [the conclusion that he did].
(cf., They all argued that Bill would leave the country, and [leave the country] I must conclude that he did.)

b. *Everyone said that Mary would talk about this topic, and [talk about this topic] I left [because she did]. (Bruening 2002:1–2)

One of the reviewers raised the question of how this island sensitivity of a predicate phrase is captured within the framework where movement of this sort does not create a chain that is represented in the LF representation. Here, I suggest that if we adopt an independently motivated approach to island constraints proposed by Merchant (2008), the fact that topicalization of a predicate phrase is sensitive to island constraints can be explained in a way compatible with the analysis that I have postulated for movement of a predicate phrase.

To set the stage, let us first consider the fact that a violation of an island constraint can be remedied by Sluicing, as shown in (88) and (89) (Chung et al. 1995; Fox and Lasnik 2003; Merchant 2001, 2008; Ross 1969, among many others). (Angle brackets are employed to indicate the elided material.)

(88) a. The administration has issued a statement that it is willing to meet with one of the student groups, but I'm not sure which one ⟨it has issued a statement that it is willing to meet with⟩.

b. ?*The administration has issued a statement that it is willing to meet with one of the student groups, but I'm not sure which one it has issued a statement that it is willing to meet with. (Chung et al. 1995:272–273)

(89) a. Ben will be mad if Abby talks to one of the teachers, but she couldn't remember which ⟨Ben will be mad if she talks to⟩.

b. *Ben will be mad if Abby talks to one of the teachers, but she couldn't remember which (of the teachers) Ben will be mad if she talks to.
(Merchant 2008:136)

Merchant's account of this fact consists of two components. First, Merchant argues that intermediate traces left behind by movement of a phrase out of an island are marked with a special feature (a *-feature in Merchant's term) (see Merchant 2008, for full discussion of this idea). Secondly, Merchant assumes that traces marked with the *-feature are uninterpretable at PF. Given these assumptions, if a trace marked with the *-feature remains in the PF representation, as in (90a), an island violation effect emerges, which makes (88b) ungrammatical.[38] The fact that a violation of an island constraint is nullified by Sluicing straightforwardly follows from this analysis. As shown in (90b), the traces marked with the *-feature are eliminated from the PF representation by Sluicing, which involves deletion of the relevant TP.

[38]Following Merchant (2008), I assume that a TP-adjoined position is an intermediate landing site in (90); this is not crucial for our discussion.

(90) a. ...*I'm not sure [$_{CP}$ [which one]$_1$[$_{TP}$ *t$_1$[$_{TP}$ it has [$_{VP}$ *t$_1$[$_{VP}$ issued [$_{island}$ a statement that it is willing to meet with t$_1$]]]]]]

b. ... I'm not sure [$_{CP}$ [which one]$_1$~~[$_{TP}$ *t$_1$[$_{TP}$ it has [$_{VP}$ *t$_1$[$_{VP}$ issued [$_{island}$ a statement that it is willing to meet with t$_1$]]]]]~~]

Merchant's approach to island constraints helps us capture the fact that topicalization of a predicate phrase is sensitive to island constraints within the proposed framework. I have argued that a moved predicate phrase receives an interpretation only in its base-generated position because copies of the moved predicate phrase that are not in its original position must be deleted at LF. Thus, the sentence in (91) is parsed as the LF representation in (92a). However, the intermediate trace marked with the *-feature survives in the PF representation, as shown in (92b), because deleting the higher copies at LF does not have any effect on the PF representation, and more importantly, the sentence in (91) does not involve ellipsis, which is the only procedure to eliminate *-feature marked elements from the PF representation. Consequently, the PF representation in (92b) is uninterpretable, due to the presence of the intermediate trace marked with the *-feature, which makes (91) ungrammatical.

(91) *They all argued that Bill would leave the country, and [leave the country] I resent [the conclusion that he did].

(92) a. LF: [~~[leave the country]~~ [$_{TP}$ I [$_{VP}$ ~~[leave the country]~~ [$_{VP}$ resent [$_{island}$ the conclusion that he did [leave the country]]]]]]

b. PF: [[leave the country] [$_{TP}$ I [$_{VP}$ *[leave the country] [$_{VP}$ resent [$_{island}$ the conclusion that he did [leave the country]]]]]]

Before closing this section, let me discuss ramifications of the idea that a non-D-type constituent can undergo semantically vacuous movement for the analysis of moved clausal complements. There is good reason to believe that semantically vacuous movement is not applicable to a clausal complement CP even though it is a non-D-type constituent. If it could undergo semantically vacuous movement, it would become less clear why it is impossible to topicalize a clausal complement of *hope*-class predicates. The relevant fact is repeated here as (93a).

(93) a. *That the Giants would win the World Series, most baseball fans reasoned.

b. Most baseball fans reasoned that the Giants would win the World Series.

Note that if semantically vacuous movement was available in (93a), there should be an option in which the clausal complement is analyzed as a CP because a non-D-type constituent can undergo semantically vacuous movement. Thus, we would expect that (93a) and (93b) could share the same LF representation in (94), where the selectional property of the *hope*-class predicate is satisfied.

(94) [most baseball fans reasoned [$_{CP}$ that the Giants would win the World Series]]

It appears that the availability of semantically contentful movement is responsible for the unavailability of semantically vacuous movement. I have argued that a clausal

complement CP can be equipped with a covert definite Det. Because the covert Det analysis is available to a clausal complement, it can potentially undergo semantically contentful movement. On the other hand, a covert definite Det cannot combine with a predicate phrase because the resulting structure leads to type mismatch. Suppose that a covert definite Det merges with a VP or an AP, which is of type ⟨e,t⟩. This merger operation produces a constituent of type ⟨e⟩. However, such a constituent cannot combine with an external argument, which is of type ⟨e⟩ or ⟨⟨e,t⟩,t⟩. Given this, there is no way to apply semantically contentful movement to predicate phrases. On the basis of this difference between clausal complements and predicate phrases, I speculate that semantically vacuous movement of a clausal complement CP is prohibited by a certain kind of economy condition, which prefers an application of semantically contentful movement over an application of semantically vacuous movement.[39] Exploring the exact nature of this condition is left for future research.

7 Conclusion

I have argued for a hidden structural aspect of moved clausal complements. Specifically, I claimed that a clausal complement CP must involve the covert definite Det when it undergoes movement. This requirement is one instantiation of the general condition that when a constituent moves in syntax, creating a chain that is represented at LF, it must be a D-type constituent. This general condition can be taken as a consequence of the properties of the procedure for converting an uninterpretable movement chain into an interpretable syntactic object. I demonstrated that this covert Det analysis offers a straightforward explanation of the generalization that movement of a clausal complement must have properties that DP movement has. Furthermore, the reconstruction and the Condition C bleeding effects exhibited by movement of a clausal complement were shown to be accounted for by the independently motivated counter-cyclic merger in a way compatible with the copy theory of movement. An analysis along this line is only possible under the assumption that a moved clausal complement is equipped with a Det. Since the presence of these effects is otherwise puzzling, I take this fact to be an argument in favor of the covert Det analysis. Finally, I suggested that certain aspects of the distribution of clausal complements can be attributed to a special licensing condition on the covert Det, which requires a constituent headed by a covert Det to undergo overt movement to the Spec of TopicP.

I would like to end this article with some questions that have to do with cross-linguistic variation. The first question concerns the cross-linguistic variation in the type of Det that combines with a clausal complement CP. Basque and Modern Greek

[39] If there is a condition along this line, it would prohibit a derivation in (i) that has not been considered so far. (This possibility was pointed out by Marcel den Dikken.) In (i), the covert Det structure of a clausal complement is base-generated and only the CP undergoes movement.

(i) $[[_{CP} \ldots\ldots] \ldots [\ldots V\ [_{DP}\ \textsc{the}\ [_{CP} \ldots\ldots]]]]$

Since the CP is not a D-type constituent, it must undergo semantically vacuous movement. However, this application of semantically vacuous movement is blocked by the presence of the possibility that the covert Det structure of a clausal complement can undergo semantically contentful movement.

(and English under the current proposal) employ a definite Det. On the other hand, Persian uses a demonstrative. What factor is responsible for this cross-linguistic variation? The second source of cross-linguistic variation lies in whether a relevant Det can be overtly realized or not. It can be overtly realized in Basque, Modern Greek, and Persian, but not in English. Why is the definite Det unable to surface in English? A related question concerns the fact that whether a relevant Det is covert or overt is correlated with whether overt movement of a clausal complement that involves the Det is required or not. We have seen that the relevant Det is overtly realized in Modern Greek and Persian. In these languages, a clausal complement headed by the overt Det can remain in situ. This can most clearly be seen in (95) and (96) where the clausal complement appears in the complement of a preposition.

(95) [PP apo [DP *(to) [CP oti etreme]]] (Modern Greek)
from the-ACC that was shaking-3SG
'from the fact that he was shaking' (Roussou 1991:78, 94)

(96) Sārā [PP az [DP in [CP ke dar in mosābeqe barande (Persian)
Sarah from this that in this competition winner
na-shode]]] xeyli sharmande ast.
NEG-become.PRT.3SG very ashamed be.3SG
'Sarah is very embarrassed at this that she didn't win the competition.'

(Farudi 2007:9)

In contrast, the relevant Det in English is covert and, as discussed above, the structure equivalent to (95) and (96) is ruled out in this language. What is responsible for this correlation? These are among the questions that await resolution in future research.

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References

Adger, David, and Josep Quer. 2001. The syntax and semantics of unselected embedded questions. *Language* 77: 107–133.

Alrenga, Peter. 2005. A sentential subject asymmetry in English and its implications for complement selection. *Syntax* 8: 175–207.

Bayer, Samuel. 1990. Tough movement as function composition. In *Proceedings of the 9th west coast conference on formal linguistics*, ed. Aaron L. Halpern, 29–42. Stanford: CSLI Publications.

Bhatt, Rajesh, and Roumyana Pancheva. 2004. Late merger of degree clauses. *Linguistic Inquiry* 35: 1–45.

Bhatt, Rajesh, and Roumyana Pancheva. 2007. Degree quantifiers, position of merger effects with their restrictors, and conservativity. In *Direct compositionality*, eds. Chris Barker and Pauline Jacobson, 306–335. Oxford: Oxford University Press.

Bresnan, Joan. 1995. Category mismatches. In *Theoretical approaches to African linguistics*, ed. Akiniyi Akinlabi, 19–45. Trenton: Africa World Press.

Bruening, Benjamin. 2002. On wh movement. Lecture notes, University of Delaware. http://www.ling.udel.edu/bruening/Courses/2001-2/610/Lecture16.pdf. Accessed 1 February 2010.

Chomsky, Noam. 1981. *Lectures on government and binding: the Pisa lectures*. Dordrecht: Foris.

Chomsky, Noam. 1982. *Some concepts and consequences of the theory of government and binding*. Cambridge: MIT Press.

Chomsky, Noam. 1993. A minimalist program for linguistic theory. In *The view from Building 20: essays in linguistics in honor of Sylvain Bromberger*, eds. Kenneth Hale and Samuel Jay Keyser, 1–52. Cambridge: MIT Press.

Chomsky, Noam. 1995. *The minimalist program*. Cambridge: MIT Press.

Chomsky, Noam. 2000. Minimalist inquiries: the framework. In *Step by step: essays on minimalist syntax in honor of Howard Lasnik*, eds. Roger Martin, David Michaels, and Juan Uriagereka, 89–155. Cambridge: MIT Press.

Chomsky, Noam. 2001. Derivation by phase. In *Ken Hale: a life in language*, ed. Michael Kenstowicz, 1–52. Cambridge: MIT Press.

Chung, Sandra, William A. Ladusaw, and James McCloskey. 1995. Sluicing and logical form. *Natural Language Semantics* 3: 239–282.

Davies, William, and Stanley Dubinsky. 1998. Sentential subjects as complex NPs: new reasons for an old account of Subjacency. In *Proceedings from the main session of the 34th annual meeting of Chicago Linguistic Society*, eds. M. Catherine Gruber, Derrick Higgins, Kenneth S. Olson, and Tamra Wysocki, 83–94. Chicago: University of Chicago, Chicago Linguistic Society.

Davies, William, and Stanley Dubinsky. 1999. Functional structure and a parameter account of subject properties. In *Proceedings of the 15th eastern states conference on linguistics*, eds. Rebecca Daly and Anastasia Riehl, 48–59. Ithaca: Cornell University, CLC Publications.

Davies, William, and Stanley Dubinsky. 2001. Functional architecture and the distribution of subject properties. In *Objects and other subjects: grammatical functions, functional categories and configurationality*, eds. William Davies and Stanley Dubinsky, 247–279. Dordrecht: Kluwer.

Delahunty, Gerald. 1983. But sentential subjects do exist. *Linguistic Analysis* 12: 379–398.

den Dikken, Marcel. 1995. *Particles: on the syntax of verb-particle, triadic, and causative constructions*. New York: Oxford University Press.

Elbourne, Paul. 2001. E-type anaphora as NP-deletion. *Natural Language Semantics* 9: 241–288.

Elbourne, Paul. 2005. *Situations and individuals*. Cambridge: MIT Press.

Emonds, Joseph. 1976. *A transformational approach to English syntax: root, structure-preserving, and local transformations*. New York: Academic Press.

Emonds, Joseph. 1985. *A unified theory of syntactic categories*. Dordrecht: Foris.

Epstein, Samuel David. 1989. Quantification in null operator constructions. *Linguistic Inquiry* 20: 647–658.

Farudi, Annahita. 2007. An antisymmetric approach to Persian clausal complements. Manuscript, University of Massachusetts, Amherst. http://people.umass.edu/afarudi/GP%201%20Filed%20version%20.pdf. Accessed 1 February 2010.

Fox, Danny. 1999. Reconstruction, binding theory, and the interpretation of chains. *Linguistic Inquiry* 30: 157–196.

Fox, Danny. 2000. *Economy and semantic interpretation*. Cambridge: MIT Press.

Fox, Danny. 2002. Antecedent-contained deletion and the copy theory of movement. *Linguistic Inquiry* 33: 63–96.

Fox, Danny, and Martin Hackl. 2006. The universal density of measurement. *Linguistics and Philosophy* 29: 537–586.

Fox, Danny, and Howard Lasnik. 2003. Successive-cyclic movement and island repair: the difference between sluicing and VP-ellipsis. *Linguistic Inquiry* 34: 143–154.

Freidin, Robert. 1986. Fundamental issues in the theory of binding. In *Defining the constraints*, Vol. 1 of *Studies in the acquisition of anaphora*, ed. Barbara Lust, 151–188. Dordrecht: Reidel.

Grimshaw, Jane. 1982. Subcategorization and grammatical relations. In *Subjects and other subjects: proceedings of the Harvard conference on the representation of grammatical relations*, ed. Annie Zaenen, 35–55. Bloomington: Indiana University Linguistics Club.

Han, Jin Hye. 2005. A DP/NP-shell for subject CPs. In *Proceedings of the 31st annual meeting of the Berkeley Linguistics Society: general session and parasession on prosodic variation and change*, eds. Rebecca T. Cover and Yuni Kim, 133–143. Berkeley: University of California, Berkeley Linguistics Society.

Heim, Irene, and Angelika Kratzer. 1998. *Semantics in generative grammar*. Oxford: Blackwell.

Heycock, Caroline. 1995. Asymmetries in reconstruction. *Linguistic Inquiry* 26: 547–570.
Higgins, Roger. 1973. On J. Emonds's analysis of extraposition. In Vol. 2 of *Syntax and semantics*, ed. John Kimball, 149–195. New York: Academic Press.
Hintikka, Jaakko. 1962. *Knowledge and belief.* Ithaca: Cornell University Press.
Hornstein, Norbert, and Amy Weinberg. 1981. Case theory and preposition stranding. *Linguistic Inquiry* 12: 55–91.
Huang, James C.-T. 1993. Reconstruction and the structure of VP: some theoretical consequences. *Linguistic Inquiry* 24: 103–138.
Jacobson, Pauline. 1992. The lexical entailment theory of control and the *tough*-construction. In *Lexical matters*, eds. Ivan Sag and Anna Szabolcsi, 269–299. Stanford: CSLI Publications.
Jacobson, Pauline. 2004. Direct compositionality: is there any reason why not? Paper presented at the workshop in linguistics and philosophy, University of Michigan.
Johnson, Kyle. 2004. Clausal edges and their effect on scope. In *Peripheries: syntactic edges and their effects*, eds. David Adger, Cécile De Cat, and George Tsoulas, 289–311. Dordrecht: Kluwer.
Kaplan, Ronald, and Joan Bresnan. 1982. Lexical-functional grammar: a formal system for grammatical representation. In *The mental representation of grammatical relations*, ed. Joan Bresnan, 173–281. Cambridge: MIT Press.
Koster, Jan. 1978. Why subject sentences don't exist. In *Recent transformational studies in European languages*, ed. Samuel Jay Keyser, 53–64. Cambridge: MIT Press.
Kratzer, Angelika. 1977. What *must* and *can* must and can mean. *Linguistics and Philosophy* 1: 337–355.
Kratzer, Angelika. 2006. Decomposing attitude verbs. Talk presented at the Hebrew University of Jerusalem.
Kuno, Susumu. 1973. Constraints on internal clauses and sentential subjects. *Linguistic Inquiry* 3: 363–385.
Kuno, Susumu. 2004. Empathy and direct discourse perspectives. In *The handbook of pragmatics*, eds. Laurence Horn and Gregory Ward, 315–343. Malden: Blackwell.
Landau, Idan. 2007. EPP extensions. *Linguistic Inquiry* 38: 485–523.
Lasnik, Howard. 1998. Some reconstruction riddles. In *Proceedings of the 22nd annual Penn linguistics colloquium: University of Pennsylvania working papers in linguistics 5.1*, eds. Alexis Dimitriadis, Hikyoung Lee, Christine Moisset, and Alexander Williams, 83–98. Philadelphia: University of Pennsylvania, Department of Linguistics, Penn Linguistics Club.
Lasnik, Howard. 1999. Chains of arguments. In *Working minimalism*, eds. Samuel David Epstein and Norbert Hornstein, 189–215. Cambridge: MIT Press.
Lasnik, Howard, and Mamoru Saito. 1992. *Move α: conditions on its application and output.* Cambridge: MIT Press.
Lebeaux, David. 1988. Language acquisition and the form of grammar. Doctoral dissertation, University of Massachusetts,. Amherst.
Lebeaux, David. 1998. Where does binding theory apply? Technical report, NEC Research Institute, Inc., Princeton, N.J.
Merchant, Jason. 2001. *The syntax of silence: sluicing, islands, and the theory of ellipsis.* Oxford: Oxford University Press.
Merchant, Jason. 2008. Variable island repair under ellipsis. In *Topics in ellipsis*, ed. Kyle Johnson, 132–153. Cambridge: Cambridge University Press.
McCarthy, Corrine. 2003. Reconstruction and Condition C: some unexpected symmetries. In *McGill working papers in linguistics 18(2)*, eds. Theres Grüter and Tomokazu Takehisa, 25–44. Montreal: McGill University, Department of Linguistics.
McCloskey, James. 1991. *There*, *it*, and agreement. *Linguistic Inquiry* 22: 563–567.
Moulton, Keir. 2007a. Clausal complementation and the *wager*-class. Manuscript, University of Massachusetts, Amherst.
Moulton, Keir. 2007b. Natural selection and the syntax of clausal complementation. Manuscript, University of Massachusetts, Amherst.
Moulton, Keir. 2008. (Not) moving CPs. Manuscript, University of Massachusetts, Amherst.
Postal, Paul. 1986. *Studies of passive clauses.* Albany: State University of New York Press.
Postal, Paul. 1994. Parasitic and pseudoparasitic gaps. *Linguistic Inquiry* 25: 63–117.
Romero, Maribel. 1998. The correlation between scope reconstruction and connectivity effects. In *Proceedings of the 16th west coast conference on formal linguistics*, eds. Emily Curtis, James Lyle, and Gabriel Webster, 351–365. Stanford: CSLI Publications.
Rosenbaum, Peter. 1967. *The grammar of English predicate complement constructions.* Cambridge: MIT Press.

Ross, John Robert. 1967. Constraints on variables in syntax. Doctoral dissertation, MIT.
Ross, John Robert. 1969. Guess who? In *Papers from the fifth regional meeting of the Chicago Linguistic Society*, eds. Robert I. Binnick, Alice Davison, Georgia M. Green, and Jerry L. Morgan, 252–286. Chicago: University of Chicago, Chicago Linguistic Society.
Roussou, Anna. 1991. Nominalized clauses in the syntax of Modern Greek. In Vol. 3 of *UCL working papers in linguistics*, ed. Hans van de Koot, 77–100. London: University College London, Department of Phonetics and Linguistics.
Safir, Ken. 1999. Vehicle change and reconstruction. *Linguistic Inquiry* 30: 587–620.
Sauerland, Uli. 1998. The meaning of chains. Doctoral dissertation, MIT.
Sauerland, Uli. 2001. A contrast to a trace. In *Proceedings of the 20th west coast conference on formal linguistics*, eds. Karine Megerdoomian and Leora Anne Bar-el, 498–509. Somerville: Cascadilla Press.
Sauerland, Uli. 2004. The interpretation of traces. *Natural Language Semantics* 12: 63–124.
Sauerland, Uli, and Paul Elbourne. 2002. Total reconstruction, PF movement, and derivational order. *Linguistic Inquiry* 33: 283–319.
Sportiche, Dominique. 2005. Division of labor between Merge and Move: strict locality of selection and apparent reconstruction paradoxes. In *Proceedings of the workshop on Division of Linguistic Labor: the La Bretesche workshop*, Los Angeles: University of California.
Sportiche, Dominique. 2006. Reconstruction, binding, and scope. In Vol. IV of *The Blackwell companion to syntax*, eds. Martin Everaert and Henk van Riemsdijk, 35–93. Oxford: Blackwell.
Stowell, Timothy. 1981. Origins of phrase structure. Doctoral dissertation, MIT.
Takahashi, Shoichi. 2006. Decompositionality and identity. Doctoral dissertation, MIT.
Takahashi, Shoichi. 2008. Variable binding in temporal adverbial clauses: evidence from ellipsis. In *Proceedings of the 26th west coast conference on formal linguistics*, eds. Hannah Haynie and Charles Chang, 445–453. Somerville: Cascadilla Press.
Takahashi, Shoichi, and Sarah Hulsey. 2009. Wholesale late merger: beyond the A/Ā-distinction. *Linguistic Inquiry* 40: 387–426.
Takano, Yuji. 1995. Predicate fronting and internal subjects. *Linguistic Inquiry* 26: 327–340.
van Riemsdijk, Henk, and Edwin Williams. 1981. NP-structure. *The Linguistic Review* 1: 171–217.
von Fintel, Kai, Danny Fox, and Sabine Iatridou. 2005. Definiteness as maximal informativeness. Manuscript, MIT.
Webelhuth, Gert. 1992. *Principles and parameters of syntactic saturation*. New York: Oxford University Press.
Weisler, Steven. 1982. Coordination and the syntax of *that*-clauses. In *University of Massachusetts occasional papers in cognitive science*, eds. Alan Prince and Steven Weisler, 113–133. Amherst: University of Massachusetts, GLSA Publications.
Williams, Edwin. 1981. Argument structure and morphology. *The Linguistic Review* 1: 81–114.