UNINTERPRETABLE FEATURES AND THE IMMOBILITY OF CONSTITUENTS

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This paper investigates the immovability of phasal complements (Abels (2003)), the (in)applicability of VP Topicalization in raising, control, and Exceptional Case-Marking constructions, and the (im)mobility of raising infinitives, small clauses, and control infinitives. I explain a variety of contrasts exhibited in these superficially unrelated movement phenomena in terms of a minimalist assumption that Value and Transfer of uninterpretable features happen simultaneously in order to satisfy the principle of Full Interpretation ((Epstein and Seely (2002), Chomsky (2007, 2008)). The proposed analysis also captures patterns of movement observed in be likely to constructions.*

Keywords: Value-Transfer Simultaneity, movement, Stranding Generalization, raising, control

1. Introduction

One of the tasks in the Minimalist Program is to give a unified analysis of various linguistic phenomena and thereby to explore a simple design for language. This paper tries to achieve this aim through examination of movement phenomena exemplified in from (1) to (3).1,2

* This is a revised and extended version of the papers that appeared in Explorations in English Linguistics 25 (Arano (2011)) and JELS 29 (Arano (2012)), the latter of which was presented at the 29th Conference of the English Linguistic Society of Japan, held at Niigata University on November 12–13, 2011. I am very grateful to Yoshiaki Kaneko, Etsuro Shima, and an anonymous proof-reader and anonymous reviewers of English Linguistics for their invaluable comments and suggestions. I would also like to express my gratitude to Satoru Kanno, Taichi Nakamura, Fumikazu Niinuma, Motoki Sato, Takahiro Tozawa, and the audience of the conference for their significant comments and suggestions. My special gratitude goes to my informants. All remaining errors and inadequacies are of course my own.

1 In this paper, I owe the judgment of sentences with no reference to my informants.

2 My informants agree with the judgments of the sentences from Larson (1980). I would like to thank an EL reviewer for urging me to clarify this point.
(1) a. Nobody believes that anything will happen.  
    b. That anything will happen, nobody believes.  
    c. *Anything will happen, nobody believes that.  

    \text{(Abels (2003: 116))}

(2) a. *Seem to be very shrewd, he did.  
    b. Seem very shrewd, he did.  
    c. Try to be very shrewd, he did.  
    d. Believe him to be shrewd, she did.  

    \text{(Larson (1980: 290))}

(3) a. *To be very shrewd, she seemed.  
    b. Very shrewd, he seemed.  
    c. To be very shrewd, she tried.  

    \text{(Larson (1980: 290))}

(1) shows that movement operation can apply to finite CPs, but not to finite TPs. This contrast is a part of the Abels's (2003) Stranding Generalization, which dictates that phasal complements cannot be moved. (2) illustrates the possibility of VP Topicalization with regard to four types of matrix predicate, i.e. a raising predicate taking an infinitival, a raising predicate taking a small clause, a control predicate, and an Exceptional Case-Marking (ECM) predicate. Of these four, only the first cannot be subject to VP Topicalization. (3) indicates the movability of three types of clausal complement, i.e. a raising infinitive, a small clause, and a control infinitive, of which only the first cannot undergo movement. These movement phenomena have not been given a unified analysis, to the best of my knowledge.

This paper tries to derive the various contrasts shown in the above examples from VTS (Value-Transfer Simultaneity) ((Epstein and Seely (2002), Chomsky (2007, 2008)).

(4) Value-Transfer Simultaneity  
Value and Transfer of uninterpretable features must happen simultaneously.

I demonstrate that the unacceptable examples involve a contravention of (4), whereas the acceptable ones do not.

This paper is organized as follows. Section 2 begins by outlining the Multiple Spell-Out model of grammar and explicating the motivation for VTS, and then briefly reviews its implication for Feature Inheritance (Richards (2007)). The following sections are devoted to accounting for diverse patterns of movement by VTS. Section 3 accounts for the immobility of phasal complements (Abels (2003)). Section 4 explains the differences among raising, control, and ECM constructions. Section 5 deals with raising predicates taking a small clause complement. Section 6 extends our analysis to \textit{be likely to} constructions. Section 7 concludes this paper.
2. Framework

A recent version of the Minimalist Program assumes the framework of Multiple Spell-Out, according to which syntactic structures are built in a bottom-up fashion and are cyclically sent to the sensorimotor and C-I (Conceptual-Intentional) interfaces by the operation of Transfer, based on units called phases (Chomsky (2000 et seq.)). When we put our focus on Transfer to the C-I interface, two types of feature are relevant: interpretable (i.e. semantic) and uninterpretable (i.e. formal) ones. The former contribute to meaning at the interface and, hence, cannot be eliminated. The latter are illegible at the interface and, given the principle of Full Interpretation (Chomsky (1986)), must be deleted when transferred to the interface.\(^3\)

These two types of feature are assumed to differ in whether or not they have initial values (Chomsky (2001)). While interpretable features enter the derivation already valued, uninterpretable features enter the derivation unvalued. Thus, $\varphi$-features of nominals are introduced with values because they are interpretable. By contrast, $\varphi$-features of T heads are not initially valued due to their uninterpretability. Uninterpretable features get their values under the operation of Agree in the course of derivation (Chomsky (2000, 2001)). Once assigned values, however, they become indistinguishable from interpretable features, because interpretable and uninterpretable features have the same status in that they have values. This poses a problem. Though Full Interpretation requires only the deletion of uninterpretable features at the time of Transfer, the distinction between the two has been lost after the operation of Agree. This reasoning makes us assume VTS, repeated in (5) (Epstein and Seely (2002), Chomsky (2007, 2008)).

(5) Value and Transfer of uninterpretable features must happen simultaneously.

The simultaneous application of Value and Transfer makes the distinction between interpretable and uninterpretable features detectable when Transfer applies, and only the latter are successfully deleted.

Richards (2007) shows that, in the framework of Multiple Spell-Out, VTS explains why Feature Inheritance (Chomsky (2007, 2008)) applies obligatorily. Assume, following Chomsky (2007, 2008), that cyclic Transfer targets the complement domain of a phase head and that uninterpretable $\varphi$-features

\(^3\) Uninterpretable features cannot be deleted before Transfer, because they may have a phonetic realization (Chomsky (2008)).
originate in a phase head, as schematized in (6), where X is a phase head and YP is its complement.

(6) \[
\begin{array}{c}
XP \\
X \\
\underline{\phi} \\
YP \\
Y \ldots
\end{array}
\]
Suppose that uninterpretable \( \phi \)-features stay on a phase head and are assigned values. Since they are not included in the Transfer domain, they are not sent to the interfaces until the next higher phase head triggers Transfer. At the next phase level, however, the distinction has been lost between interpretable and uninterpretable features, which causes a violation of VTS and of Full Interpretation at the C-I interface (the Transfer domain is indicated by shading and the valued status of features is by strikethrough).

(7) \*\[
\begin{array}{c}
XP \\
X \\
\underline{\phi} \\
YP \\
Y \ldots
\end{array}
\]
Next, suppose that uninterpretable \( \phi \)-features are transmitted to a lower head. In this case, they are valued within the transferred domain and, hence, are subject to simultaneous Value and Transfer, as schematized in (8).\(^4\)

(8) \[
\begin{array}{c}
XP \\
X \\
YP \\
Y \ldots
\end{array}
\]
Thus, Richards (2007) shows that VTS has a consequence to the effect that the application of Feature Inheritance is mandatory under the cyclic Transfer model.

3. The Immobility of Phasal Complements

Hereafter, I explore further consequences of VTS in terms of movement.

First, I demonstrate in this section that VTS provides a straightforward account of Abels’s (2003) Stranding Generalization—that phasal complements are unable to move.

Chomsky (2008) argues that C and \( \nu^* \) are phase heads and that they send uninterpretable \( \phi \)-features to a head of their complement, as illustrated in (9).

(9) \[
\begin{array}{c}
XP \\
X \\
\underline{\phi} \\
YP \\
Y \underline{\phi} \ldots \underline{\phi}
\end{array}
\]
Suppose that YP, a phasal complement, moves to the phase edge and evacuates the transferred domain.

(10) \*\[
\begin{array}{c}
XP \\
\underline{Y} \underline{P} \\
\underline{\phi} \ldots \\
X' \\
X \underline{\phi}
\end{array}
\]

\(^4\) Chomsky (2007, 2008) proposes that all lexical items have edge features. Though uninterpretable, they have a different status than standard uninterpretable features, in that they have no value and are assumed to be deleted automatically at the point of Transfer (Chomsky (2007: 11, fn.16)).
The situation illustrated in (10) is against VTS and induces a violation of Full Interpretation at the C-I interface, because valued uninterpretable φ-features of Y are not included in the Transfer domain. Thus, VTS predicts that the ungrammaticality arises when phasal complements are moved. More concretely, it is predicted that movement operation cannot apply to TP that is a complement of C.

(11) a. $[\text{CP } C[uφ] \quad [\text{TP } T[uφ] \ldots ]]$

b. $[^*\text{CP } \text{TP } T[uφ] \ldots ] [C' C [\text{ITP}]$

Then, the immobility of finite TPs can be regarded as a straightforward consequence of the VTS analysis.

(12) a. Nobody believes that anything will happen.

b. That anything will happen, nobody believes.

c. *Anything will happen, nobody believes that.

(13) a. It’s that Desdemona was faithful that Othello doubted.

   (Matushansky (2005: 162))

b. *It’s Desdemona was faithful that Othello doubted that.

   (Emoto (2008: 10))

Abels (2003) accounts for the immobility of phasal complements by relying on the anti-locality condition, which amounts to a general prohibition on comp-to-spec movement. Since a phasal complement cannot move to the edge of the phase head, it cannot escape from the Phase Impenetrability Condition (Chomsky (2000)) effect induced by the phase head. Though Abels’s account can capture the immobility of phasal complements, it has nothing to say on movement of constituents embedded within phasal complements. In contrast, the VTS analysis can be extended to such cases, as

5 For the same reason, the head of phasal complements cannot undergo head movement in narrow syntax. Therefore, T-to-C and V-to-$v^{*}$ movements occur in the PF-component (cf. Boeckx and Stjepanović (2001)).

6 As Takahiro Tozawa (personal communication) points out, Right-Node Raising may isolate TP.

(i) John believes that and Peter claims that—Mary will get a job.

   (Abels (2003: 123))

If Right-Node Raising is derived not through movement, but through deletion or multiple domination, it is compatible with my analysis. See Bachrach and Katzir (2009), Barros and Vicente (2011), and references cited therein.

7 The same explanation applies to the impossibility of VP movement in the $v^{*}P$ phase, discussed at length in Abels (2003).
we will see in the following sections.
Summarizing this section, we have seen that the VTS analysis explains why phasal complements cannot be moved. Before moving onto the next section, I would like to touch on a Case feature, another type of uninterpretable feature. VTS, as it stands, also restricts movement of constituents containing an uninterpretable Case feature. Thus, long-distance movement of noun phrases is incorrectly predicted to be impossible because they have an uninterpretable Case feature.

(14) Who do you think bought this book?
I assume, following Richards (2012), that uninterpretable Case features are not subject to VTS. In contrast to φ-features, there are no interpretable counterparts of uninterpretable Case features. Therefore, the distinguishability problem does not arise for Case.8

4. Raising, Control, and ECM Constructions

From this section we extend the VTS analysis to the environment illustrated in (15), where ZP is embedded within YP, a phasal complement.

(15) a. \[XP \ X \ [YP \ [ZP \ \ldots[uφ]\ldots]]]\n   b. \[^{\ast}\ [XP \ [ZP \ \ldots[uφ]\ldots]] \ [X' \ X \ [YP \ \ldots[uφ]\ldots]]]\n
Movement of ZP is precluded if it contains uninterpretable φ-features. Furthermore, if the ungrammaticality in (15b) arises from uninterpretable φ-features violating VTS, it is expected to stand in contrast to the situation shown in (16), where uninterpretable φ-features have been subject to Transfer within ZP.

(16) a. \[ZP \ \ldots[uφ]\ldots]\n   b. \[XP \ X \ [YP \ [ZP \ \ldots[uφ]\ldots]]]\n   c. \[XP \ [ZP \ \ldots[uφ]\ldots] \ [X' \ X \ [YP \ \ldots[uφ]\ldots]]]\n
In this case movement of ZP will be possible because uninterpretable φ-features have satisfied VTS within ZP.

This section validates the contrast between (15) and (16) by comparing raising constructions, on the one hand, and control and ECM constructions, on the other hand. I show that it matters whether there is an application of Transfer triggered by C and v*.

8 For an alternative view, see Obata and Epstein (2011).
4.1. Raising and Control Predicates Selecting To-infinitival Complements

Raising and control constructions involving infinitives are derived as shown in (17) and (18). The raising predicate selects a TP complement whose head contains uninterpretable φ-features (Chomsky (2001)). ⁹ Since there is no embedded C head, the embedded T’s uninterpretable φ-features are subject to Transfer triggered by the matrix C. ¹⁰ The control predicate, on the other hand, takes a CP complement that is formed as in (18b, c). Due to the presence of the C head in the embedded clause, the embedded T is sent to the interfaces before the building of the matrix clause.

(17) raising constructions with to-infinitival complements
   a. John seems to be nice.
   b. \[[CP \ C[uφ] \ [TP \ T[uφ] \ [vP \ vP \ seem \ [TP \ to[uφ] \ [vP \ Subj \ [v′ \ . . .]]]]]]\]
   c. \[[CP \ C \ [TP \ Subj \ [T \ T[uφ] \ [vP \ vP \ seem \ [TP \ tSubj \ [v \ to[uφ] \ [vP \ tSubj \ [v′ \ . . .]]]]]]]]\]

(18) control constructions
   a. I will try to win.
   b. \[[CP \ C[uφ] \ [TP \ to[uφ] \ [vP \ PRO \ [v′ \ . . .]]]]\]
   c. \[[CP \ C \ [TP \ PRO \ [T \ to[uφ] \ [vP \ tPRO \ [v′ \ . . .]]]]]]\]

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⁹ One EL reviewer notes that, though the assumption that non-finite Ts contain uninterpretable φ-features is a theoretical possibility, it needs to be justified on empirical grounds. I would like to motivate this assumption using ellipsis phenomena. Lobeck (1990) argues that functional heads can license ellipsis of their complement only when they are in agreement relations, i.e., they share some kind of feature with their specifier. In the current terms, then, it is reasonable to assume that T can license VP-ellipsis if it shares φ-features with its specifier. Given this, consider the following examples.

(i) a. The printer works, but the copier doesn’t seem to. (Wurmbrand (2012: 4))
   b. ?They say that Mary doesn’t like raisins but Bill believes her to. (Wurmbrand (2012: 3))
   c. Kim isn’t sure she can’t solve the problem but she will try to. (Wurmbrand (2012: 3))
   d. Rebecca wanted Jill to join the team, so Pam persuaded her to. (Martin (2001: 154))

(i) indicates that VP-ellipsis is possible in raising-to-subject, raising-to-object, subject-control, and object-control constructions (though (ib) is marked), and gives empirical support to the assumption that to’s in these constructions have φ-features.

¹⁰ I assume that the embedded T’s uninterpretable features are valued via Multiple Agree (Hiraiwa (2005)).
Given this, let us consider how the VTS analysis restricts movement of constituents in raising and control constructions. In the former, VTS prohibits the embedded T with uninterpretable φ-features from moving out of the Transfer domain. Since it bans movement of categories containing the embedded T in the same way, it is predicted that the embedded TP and the matrix vP cannot be moved to the phase edge, as shown in (19).

(19)  
- a. *[CP [TP tSubj [T to\[\ldots\]\] \[C C [TP Subj [T\[\ldots\]\] [v vP seem [TP]]]]]]
- b. *[CP [vP tSubj [v to\[\ldots\]\] \[C C [TP Subj [T to\[\ldots\]\] tP]]]]]

On the other hand, there is an application of Transfer in the control infinitive, and the embedded T observes VTS at the derivational point of (18c). Therefore, the movements of the embedded CP and the matrix vP are expected to be licit in control constructions.

(20)  
- a. [CP [CP PRO [T to\[\ldots\]\] \[C C [TP Subj [T\[\ldots\]\] \[v vP try [TP]]]]]]]
- b. [CP [vP tSubj [v vP tSubj [v to\[\ldots\]\] \[C C [TP Subj [T tP]]]]]]]

Thus, the VTS analysis predicts that raising constructions do not allow the movements of to-infinitives and matrix verb phrases, whereas control constructions do. These predictions are correct.

(21) shows that Topicalization can apply to control infinitives, but not to raising infinitives (Jacobson (1992)).

(21)  
- a. *To be very shrewd, she seemed.
- b. To be very shrewd, she tried.

(22) reiterates the point with respect to Clefting.11

11 The explanation for (21) and (22) can be applied to movement of to-infinitives in ECM and object-control constructions.

(i)  
- a. *To be nice, she believed him.
- b. *It is to be nice that Mary believed John.

(ii)  
- a. ?To be shrewd, she persuaded him.
- b. It is to be shrewd that she persuaded him.
(22) a. *It is to go home every evening that John seems.  
   b. It is to go home every evening that John prefers.  

   (Chomsky (2001: 43, fn. 13))

VP Topicalization also behaves as expected. It is compatible with control constructions, but not with raising constructions.\(^{12}\)

(23) a. *Seem to be very shrewd, he did.  
   b. Try to be very shrewd, he did.  

The VTS analysis obtains further support from the acceptability in (24), which suggests that the moved to is behind the ungrammaticality in (21a), (22a), and (23a).

(24) How old did she seem to be?

4.2. ECM Predicates

The last subsection has argued that (25) is ungrammatical due to the uninterpretable \(\phi\)-features in T.

(25) *Seem to be very shrewd, he did.

(26) a. \[(\text{CP} \ C [\text{TP} \ T \ [\text{TP} \ [\text{TP} \ [u\phi] \ [TP \ v \ [VP \ [TP \ [u\phi] \ [TP \ [u\phi] \ [TP \ [u\phi] \ [TP \ v \ vP \ [VP \ seems \ [TP \ [u\phi] \ [TP \ Subj \ [v\ldots]]\] ] ] ] ] ] ] ] ]

   b. \[ (*\text{CP} \ [TP \ [u\phi] \ [TP \ t \ [TP \ [u\phi] \ [TP \ Subj \ [v\ldots]]\] ] ] ] \ [C' \ C [TP \ Subj \ [T' \ T \ [u\phi] \ [TP \ v \ vP \ [v\ldots]]\] ] ]

The violation induced by T is remedied when there is a C head in the embedded clause, as in control constructions. Another way to avoid this violation is to replace v in (26) with \(v^*\), a phase head. Namely, the VTS analysis predicts that VP Topicalization can apply to ECM predicates, as illustrated in (27).

(27) ECM constructions

   a. \[(\text{CP} \ C [\text{TP} \ T \ [\text{TP} \ [\text{TP} \ [\text{TP} \ [u\phi] \ [TP \ v \ vP \ [VP \ believe \ [TP \ [u\phi] \ [TP \ [u\phi] \ [TP \ [u\phi] \ [TP \ v \ vP \ [v\ldots]]\] ] ] ] ] ] ] ]

   b. \[(\text{CP} \ C [\text{TP} \ T \ [\text{TP} \ [\text{TP} \ [\text{TP} \ [u\phi] \ [TP \ v \ vP \ [VP \ believe \ [TP \ [u\phi] \ [TP \ [u\phi] \ [TP \ [u\phi] \ [TP \ v \ vP \ [v\ldots]]\] ] ] ] ] ] ] ]

   c. \[(\text{CP} \ C [\text{TP} \ T \ [\text{TP} \ [\text{TP} \ [\text{TP} \ [u\phi] \ [TP \ v \ vP \ [VP \ believe \ [TP \ [u\phi] \ [TP \ [u\phi] \ [TP \ [u\phi] \ [TP \ v \ vP \ [v\ldots]]\] ] ] ] ] ] ] ]

   d. \[(\text{CP} \ [TP \ [\text{TP} \ [\text{TP} \ [\text{TP} \ [u\phi] \ [TP \ v \ vP \ [VP \ believe \ [TP \ [u\phi] \ [TP \ [u\phi] \ [TP \ [u\phi] \ [TP \ v \ vP \ [v\ldots]]\] ] ] ] ] ] ] ]

\[C' \ C [TP \ Subj \ [T' \ T \ [u\phi] \ [TP \ v \ vP \ [v\ldots]]\] ] ]

\(^{12}\) A proof-reader of EL notes that (23a) is acceptable in some dialects of English. I have checked this example with four informants. One of them found it to be of intermediate acceptability and the rest unacceptable, and thus I marked it *. I leave dialectal variations for future research.
This prediction is borne out by (28).

(28) Believe him to be nice, she did.

Thus, (28) presents another concrete example of the situation depicted in (29).

(29) a. \([ZP \ldots]\)
    b. \([XP X [YP \ldots [ZP \ldots\{uφ\}]]]\)
    c. \([XP [ZP \ldots\{uφ\}] [X' X [YP \ldots lZP \ldots]]]\)

Summarizing this section, I have shown that the VTS analysis accounts for why raising, control, and ECM constructions differ in the mobility of certain constituents. The differences are reduced to the (non)existence of Transfer induced by phase heads, which plays a crucial role in determining whether embedded T’s uninterpretable φ-features conform to VTS.

5. Raising Predicates Selecting Small Clause Complements

The last section has shown, through discussion of raising constructions, that the situation in (30) leads to the ungrammaticality.

(30) a. \([XP X [YP \ldots [ZP \ldots\{uφ\}]]]\)
    b. \(*[XP [ZP \ldots\{uφ\}] [X' X [YP \ldots lZP \ldots]]]\)

Then, the immediate prediction is that, if ZP does not contain an uninterpretable φ-feature, movement of ZP will be allowed.

(31) a. \([XP X [YP \ldots [ZP \ldots]]]\)
    b. \([XP [ZP \ldots] [X' X [YP \ldots lZP \ldots]]]\)

This section illustrates the case seen in (31) by investigating raising predicates taking a small clause complement.

I assume that raising constructions involving small clauses are derived as shown in (32), where X is a small clause predicate.

(32) raising constructions with small clause complements
    a. John seems nice.
    b. \([CP C\{uφ\} [TP T_{[uφ]} [vP seem [SC Subj X]]]]]\)
    c. \([CP C [TP Subj [T \{uφ\} [vP seem [SC [SC Subj X]]]]]]]\)

I assume that small clauses do not project TP (cf. Stowell (1983)), which in turn implies that they lack uninterpretable φ-features. This assumption is motivated by the fact that small clauses show differences with regard to the properties specific to TP.

First, small clauses do not tolerate two not’s, expressing both sentential and constituent negation, in contrast to finite clauses (Suzuki (1991)).
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(33) a. I can not obey her. (Suzuki (1991: 33))
    b. I can’t not obey her. (Quirk et al. (1985: 798))

(34) a. I consider Tom not lucky.
    b. *I consider Tom not not lucky. (Suzuki (1991: 33))

This indicates that small clauses do not have a position for sentential negation. Assuming that the TP projection is needed to license sentential negation, (34) suggests that there is no TP projection in small clauses.

Second, sentential adverbs may occur in ECM infinitivals, but not in small clauses (Nakajima (1991)).

(35) a. John considers [TP Mary probably to be scared of snakes]—certainly, she is scared of snakes.
    b. *John considers [SC Mary probably scared of snakes]—certainly, she is scared of snakes. (Nakajima (1991: 40))

As the argument from sentential negation suggests, this could lend support to motivation for the absence of the TP projection in small clauses.

I assume from these arguments that small clauses do not contain a T head with uninterpretable φ-features. Under this assumption, the VTS analysis predicts that small clauses can move out of the Transfer domain because they do not have uninterpretable φ-features, which may commit a violation of VTS. Furthermore, the matrix vP is also expected to be movable in the same way.

(36) a. [CP [SC tSubj X] [C’ C [TP Subj [vP v [VP seem [SC tSubj X]]]]]]
    b. [CP [vP v [VP seem [SC tSubj X]]] [C’ C [TP Subj [vP v [VP seem [SC tSubj X]]]]]]

(37) and (38) bear out the correctness of these predictions.

(37) Very shrewd he seemed. (Larson (1980: 290))
(38) Seem very shrewd he did. (Larson (1980: 290))

Note that (37) and (38) constitute minimal pairs with their counterparts

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13 One EL reviewer points out, citing Stowell (1981, 1983), that small clauses require the expletive it in examples like (i).
   (i)  We consider *(it) unlikely that John will win the game.
   If it in (i) occupied [Spec, TP], it would cast doubt on my argument that small clauses do not have the TP-node. I argue that this is not the case by showing that it in (i) is licensed by raising into the matrix clause (i.e. into [Spec, VP]). Consider (ii).
   (ii) a. I figured it out to be impossible for us to get there by 11:00.
       b. *I figured out it to be impossible for us to get there by 11:00. (Postal (1974: 413))
   Since it must precede the matrix element out, it is clear that it is licensed in the matrix clause. Therefore, we can safely conclude that it is licensed in [Spec, VP], not in [Spec, TP] in these examples.
involving *to*-infinitives, whose relevant points of derivations are repeated in (40).

(39)  
\begin{align*}
\text{a. } & \ast \text{To be very shrewd, he seemed.} \\
\text{b. } & \ast \text{Seem to be very shrewd, he did.}
\end{align*}

(40)  
\begin{align*}
\text{a. } & \ast [\text{CP } [\text{TP } t_{\text{Subj}} [T' \text{ to_{\text{Spec}}\ldots}]] \ [C' \ C \ [TP \ \text{Subj} \ [T' \ T \ [u_{\phi} \ldots]]] \ [CP]]] \\
\text{b. } & \ast [\text{CP } [\text{vP } \text{v} \ [\text{VP } \text{seem } [\text{TP } t_{\text{Subj}} [T' \text{ to_{\text{Spec}}\ldots}]]]] \ [C' \ C \ [TP \ \text{Subj} \ [T' \ T \ [u_{\phi} \ldots]]] \ [CP]]]
\end{align*}

A crucial difference is whether T’s uninterpretable φ-features are contained within the moved phrases. When a *to*-infinitive is selected, the relevant movements are prohibited by T’s uninterpretable φ-features. When a small clause is selected, on the other hand, the movements are licit because there is no uninterpretable φ-feature in small clauses.\(^{14}\)

6. Further Consequences

This section examines a paradigm of *be likely to* constructions, first discussed by Kroch and Joshi (1985) and having received some attention in the literature (Abels (2002), Barss (1986), Boeckx (2002), Lasnik (2002), Lasnik and Saito (1992)).

(41)  
\begin{align*}
\text{a. } & \text{John is likely to win.} \\
\text{b. } & \text{There is likely to be a riot.} \\
\text{c. } & \text{Advantage is likely to be taken of John.}
\end{align*}

\hspace{2cm}(\text{Lasnik and Saito (1992: 141)})

(42)  
\begin{align*}
\text{a. } & \text{How likely to win is John?} \\
\text{b. } & \ast \text{How likely to be a riot is there?} \\
\text{c. } & \ast \text{How likely to be taken of John is advantage?}
\end{align*}

\hspace{2cm}(\text{Lasnik and Saito (1992: 141)})

We begin the discussion by reviewing three kinds of previous analysis of the above paradigm and pointing out their empirical problems. Then, I show that our VTS-based approach could solve these problems. Further-

\(^{14}\) Given this difference between raising infinitives and small clauses, and the raising-to-object analysis (Postal (1974), Lasnik and Saito (1991), Hong and Lasnik (2010)), the present analysis accounts for a contrast between (ib) and (ic), as suggested by an EL reviewer.

(i)  
\begin{align*}
\text{a. } & \text{I consider John (to be) nice.} \\
\text{b. } & \ast \text{To be nice, I consider John.} \\
\text{c. } & \text{Nice, I consider John.}
\end{align*}

The topicalized phrase is TP in (ib) while it is the small clause in (ic).
more, in the course of explanation, we confirm the following prediction the
VTS analysis makes: If some additional movement makes uninterpretable
φ-features escape from ZP and stay within the Transfer domain as shown in
(44b), movement of ZP will be licit.

\[(43)\]
\[
a. \ [XP \ X \ [YP \ \ldots \ [ZP \ \ldots\{up\}\ldots]]]
\]
\[
b. *[[XP \ [ZP \ \ldots\{up\}\ldots]] [X' X \ [WP \ \ldots\{az\}\ldots]]]
\]

\[(44)\]
\[
a. \ [XP \ X \ [YP \ \ldots \ [WP \ \ldots\{up\}\ldots] \ \ldots \ [ZP \ \ldots\{az\}\ldots]]
\]
\[
b. \ [XP \ X \ [YP \ \ldots \ [WP \ \ldots\{up\}\ldots] \ \ldots \ [ZP \ \ldots\{az\}\ldots]]
\]
\[
c. \ [XP \ [ZP \ \ldots\{az\}\ldots]] [X' X \ [WP \ \ldots\{az\}\ldots] \ \ldots \ [ZP \ \ldots\{az\}\ldots]]
\]

6.1. Previous Studies


Lasnik and Saito (1992) analyze (42) in terms of the following two assump-
tions.

\[(45)\]
\[
PBC (Proper Binding Condition)
Traces must be bound. \quad (Fiengo (1977))
\]

\[(46)\]
\[
Likely is ambiguous between raising and control predicates.
\]

(46) says that be likely to constructions may have the control structure un-
less the raising structure is forced by the presence of an expletive or an
idiom chunk, which is incompatible with control predicates.

\[(47)\]
\[
a. *There tried to be a riot.
\]
\[
b. *Advantage wants to be taken of John.
\]

\[(48)\]
\[
a. \ [How likely [PRO\_{1} to win]]\_{2} is John\_{1} \ t_{2}?
\]
\[
b. *[How likely t\_{1} to be a riot] is there\_{1} \ t_{2}?
\]
\[
c. *[How likely t\_{1} to be taken of John] is advantage\_{1} \ t_{2}?
\]

\[(Lasnik and Saito (1992: 141))\]

Since the R-expression John can be a controller of PRO, (42a) may have
the representation in (48a), where the PBC is satisfied. By contrast, since
a control predicate cannot have an expletive or idiom chunk as its subject,
(42b) and (42c) obligatorily have a raising structure and disobey the PBC.

\[(Lasnik and Saito (1992: 141))\]

Thus, as far as the paradigm in (42) is concerned, Lasnik and Saito’s ac-
count is valid. Nevertheless, (49) presents an empirical problem with their
PBC-based approach.\[15\]

\[15\] A proof-reader of EL notes that he or she has never heard of a dialect of English
where (49b) is acceptable (cf. (Huang (1993: 107)), Boeckx (2002: 44)).
The examples in (49) are compelled to have a raising structure by the expletive or the idiom chunk in the subject position. Moreover, to derive correct word order, the infinitivals must be extraposed. Let us consider the derivation of these examples, taking (49a) as an illustration. Lasnik and Saito’s account requires the PBC to be obeyed by the trace of the extraposed infinitive and that of the expletive. As (50) and (51) show, these requirements conflict. When the embedded TP is adjoined to the matrix CP, the trace of the extraposed infinitive observes the PBC, but that of the expletive does not ((50)).

(50)

When the embedded TP is adjoined to the matrix T’, the trace of the expletive observes the PBC, but that of the extraposed infinitive does not ((51)).

(51)
Thus, the PBC-based approach incorrectly rules out (49).\footnote{In addition to this empirical problem, various empirical and conceptual arguments have been adduced against the PBC in the form of (45) (see Hiraïwa (2010) and references cited therein). Therefore, the PBC should be dispensed with and its empirical coverage needs to be reconsidered from a minimalist perspective. This section is one attempt to accomplish this aim by analyzing a paradigm of be likely to constructions in terms of VTS.}


The second approach tries to explain the contrast in (52) by assuming LF movement of an associate.

(52)  
\begin{align*}
\text{a. There is likely to be a riot.} & \quad (= (41b)) \\
\text{b. *How likely to be a riot is there?} & \quad (= (42b))
\end{align*}

Barss (1986) argues, following Chomsky (1986), that the associate a riot must replace there at LF. In a similar vein, Lasnik (2002) argues, under Chomsky’s (1995) Move F approach, that formal features of an associate must move to the matrix T to enter into the checking relation. (52b) is unacceptable because the assumed LF movement is illicit, being ‘sideways.’

(53) *[How likely to be a riot] is there T?

With regard to the contrast in (54), this approach must give another treatment because this case does not involve LF movement of an associate.

(54)  
\begin{align*}
\text{a. Advantage is likely to be taken of John.} & \quad (= (41c)) \\
\text{b. *How likely to be taken of John is advantage?} & \quad (= (42c))
\end{align*}

Barss (1986) tries to account for this case by arguing that the idiomatic reading is available if idiom chunks are assembled at LF and that an A-moved phrase cannot be reconstructed when it does not c-command the reconstruction position in the surface form. Since the subject does not c-command its base position in the surface form in (54b), the sentence is excluded.

(55) *[How likely to be taken of John] is advantage?

This explanation, however, is flawed when we consider the paradigm (56).

(56)  
\begin{align*}
\text{a. The shit hit the fan.} \\
\text{b. Hit the fan the shit did.} \\
\text{c. *How likely to hit the fan is the shit?}
\end{align*}

(56b) shows that there is an idiomatic expression that retains its idiosyncratic meaning under VP Topicalization, which is shown to be movement
of phrases containing the trace of a subject (i.e. $v^*P$ in current terms) by Huang (1993). When it is embedded under the raising predicate, however, the predicate fronting destroys its idiomatic reading. This contrast shows that be likely to constructions have some special property that cannot be captured by Barss’s account.


The third type of approach relies on RM (Relativized Minimality) (Rizzi (1990), Starke (2001)), which imposes a locality constraint such that, in a structure as in (57), the dependency can be formed between $X$ and $Z$ if there is no $Y$ of the relevant kind that is structurally closer to $X$ than $Z$ is.

\[(57) \quad [...X...Y...Z...]\]

Technical details aside, the gist of Boeckx’s (2002) and Abels’s (2002) proposal is that the matrix $T$ cannot have a relationship to elements within the embedded clause when the subject is an expletive or an idiom chunk, because a degree operator how acts as an intervener.

\[(58) \quad [\, T \, [\, how \, likely \, [...NP...]]\,]\]

The presence of how plays a key role in ruling out (59) by the RM effect.

\[(59) \quad a. \, ^*How \, likely \, to \, be \, a \, riot \, is \, there? \quad (= (42b))
   \quad b. \, ^*How \, likely \, to \, be \, taken \, of \, John \, is \, advantage? \quad (= (42c))\]

Then, this type of approach predicts that if we replace how likely in (59) with the bare adjective likely, the predicate fronting will be grammatical because it ceases to be an intervener. This prediction is false as evidenced by (60) and (61).

\[17\quad (i) \, provides \, support \, for \, base-generation \, of \, the \, shit \, within \, v^*P \, (Radford (2004)).\]

(i) a. The shit might hit the fan.
   b. The shit has hit the fan.
   c. The shit must have hit the fan. \quad (Radford (2004: 247))

If the idiomatic reading is formed within $v^*P$, it is reasonable that auxiliaries can freely intervene between the subject and the verb phrase.

\[18\quad Lasnik (2002) \, does \, not \, touch \, upon \, (54b).\]

\[19\quad Regarding \, (60a), \, a \, proof-reader \, of \, EL \, notes \, that \, he \, or \, she \, cannot \, imagine \, any \, native \, English \, speaker \, on \, earth \, producing \, it. \, However, \, similar \, acceptable \, examples \, are \, presented \, by \, van \, de \, Koot (2004).\]

(i) a. More likely to dance with every senator than some octogenarian some young lady definitely is.
   b. Very likely to dance with every senator some young lady definitely is. \quad (van de Koot (2004: 171))
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(60)  
\begin{align*}
\text{a.} & \quad \text{Likely to be assigned to the athletes one translator is.} \\
& \quad \text{(Sauerland and Elbourne (2002: 298))} \\
\text{b.} & \quad \text{*Likely to be a man outside there was.} \\
& \quad \text{(Barss (1986: 554))} \\
\text{c.} & \quad \text{*Likely to be taken of John advantage was.} \\
& \quad \text{(Barss (1986: 554))}
\end{align*}

(61)  
\begin{align*}
\text{a.} & \quad \text{Likely to be assigned to the athletes though one translator is,} \\
& \quad \ldots \\
& \quad \text{(Sauerland and Elbourne (2002: 298))} \\
\text{b.} & \quad \text{*Likely to be a man outside though there was,} \\
& \quad \ldots \\
\text{c.} & \quad \text{*Likely to be taken of John though advantage was,} \\
& \quad \ldots
\end{align*}

Thus, the RM-based approach is also insufficient to cover the full range of data.

6.2. An Alternative Analysis

This subsection tries to give an account of the paradigm in (62) and solve the problems with the previous approaches, building on the analysis of raising and control constructions developed in section 4.

(62)  
\begin{align*}
\text{a.} & \quad \text{How likely to win is John?} \\
\text{b.} & \quad \text{*How likely to be a riot is there?} \\
\text{c.} & \quad \text{*How likely to be taken of John is advantage?} \\
& \quad (=42)
\end{align*}

Before discussing (62), I motivate a raising/control ambiguity of likely, because it is essential for the VTS analysis. Recall that a control predicate is incompatible with an expletive or idiom chunk.

(63)  
\begin{align*}
\text{a.} & \quad \text{*There tried to be a riot.} \\
\text{b.} & \quad \text{Advantage wants to be taken of John.} \\
& \quad (=47)
\end{align*}

Therefore, the ambiguity is empirically motivated if we find the environment where likely shows the property of control predicates unless an expletive or an idiom chunk forces the raising structure. I summarize four pieces of evidence below.

The first evidence comes from VP complement drop (Jacobson (1992)), where verbs allow their complement to be missing. Jacobson (1992) shows that this phenomenon is observed in control constructions, but not in raising constructions.

(64)  
\begin{align*}
\text{John tried to take out of the garbage, and I think that Bill also tried.} \\
& \quad \text{(Jacobson (1992: 161))}
\end{align*}

(65)  
\begin{align*}
\text{*Bill seems to be obnoxious, but I don’t think that Sam seems.} \\
& \quad \text{(Jacobson (1992: 161))}
\end{align*}

Moreover, she reports that a few speakers find (66a) better than (66b) and suggests raising/control ambiguity with be likely to constructions.
(66)  a. ?John is likely to win, but I don’t think Bill is particularly likely.  (Jacobson (1992: 164))
    b. *John said that there’s likely to be a riot, but I don’t think that there is particularly likely.  (Jacobson (1992: 189, fn.10))

Second, control predicates, but not raising predicates, can be post-
constituents in specificational pseudoclefts.  

(67)  What John is is eager to please himself.  (Akmajian (1970: 24))
(68)  *What John is seems to be proud.  (Bošković (1997: 245))

Bošković (1997) argues, based on the contrast in (69), that the behavior of be likely to constructions is explained if we assume the ambiguity.

(69)  a. What John is is likely to win.  (Bošković (1997: 261))
    b. *What there is is likely to be someone available.  (Bošković (1997: 263))

Third, there is a contrast between raising and control predicates in the possibility of nominalization (Chomsky (1970)).

(70)  a. John attempted to please.  
    b. John’s attempt to please surprised us.  (Kroch and Joshi (1985: 46))
(71)  a. John appears to have left.  (Kroch and Joshi (1985: 45))
    b. *John’s appearance to have left surprised us.  (Kroch and Joshi (1985: 46))

Given this contrast, Lasnik and Saito (1992) present (72) as evidence for the ambiguity.

(72)  a. ??John’s likelihood to win  (Lasnik and Saito (1992: 141))
    b. *Advantage’s likelihood to be taken of John  (Lasnik and Saito (1992: 142))

They argue that (72a) is only marginal, whereas (72b) is completely ungrammatical, the cause of which can be reduced to the forced raising structure in the latter.

Fourth, and finally, we have seen in section 4 that raising and control predicates behave differently with regard to the applicability of VP Topical-

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20 Pseudocleft constructions have predicational (ib) and specificational readings (ic) (Akmajian (1970)). The former is irrelevant here.
(i)  a. What John is is important.
    b. John is an x, being an x/x-hood is important.
    c. John is important.  (Boeckx (2007: 29))
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(73) Try to be very shrewd, she did.
(74) *Seem to be very shrewd, she did.
The paradigm in (75) again corroborates the ambiguity.

(75) a. Likely to be assigned to the athletes one translator is.
b. *Likely to be a man outside there was.
c. *Likely to be taken of John advantage was. (= (60))

So far, I have recapitulated four pieces of evidence for assuming that likely is ambiguous between a control and a raising predicate.

Let us assume the raising/control ambiguity, following Lasnik and Saito (1992), and turn to the analysis of be likely to constructions. As in section 4, I assume that raising and control counterparts are derived as in (76) and (77), respectively.

(76) raising structure
   a. \([CP \ C_{[\varphi]}] \ [TP \ T_{[\varphi]}] \ [AP \ likely \ [TP \ to_{[\varphi]}] \ [vP \ Subj \ [v' \ldots]]]]\]
   b. \([CP \ C \ [TP \ Subj \ [v' \ T_{[\varphi]}] \ [AP \ likely \ [TP \ t_{Subj} \ [T \ to_{[\varphi]}] \ [vP \ t_{Subj} \ [v' \ldots]]]] \]

(77) control structure
   a. \([CP \ C_{[\varphi]}] \ [TP \ to_{[\varphi]}] \ [vP \ PRO \ [v' \ldots]]]]\]
   b. \([CP \ C \ [TP \ PRO \ [T \ to_{[\varphi]}] \ [vP \ t_{PRO} \ [v' \ldots]]]]\]
   c. \([CP \ C_{[\varphi]}] \ [TP \ T_{[\varphi]}] \ [AP \ Subj \ [A' \ likely \ [CP \ C \ [TP \ PRO \ [T \ to_{[\varphi]}] \ [vP \ t_{PRO} \ [v' \ldots]]]]]]\]
   d. \([CP \ C \ [TP \ Subj \ [T \ T_{[\varphi]}] \ [AP \ t_{Subj} \ [A' \ likely \ [CP \ C \ [TP \ PRO \ [T \ to_{[\varphi]}] \ [vP \ t_{PRO} \ [v' \ldots]]]]]]]]\]

Suppose that AP movement occurs in these derivations. When the raising structure is selected, AP movement induces a violation of VTS because the embedded T contains uninterpretable \(\varphi\)-features.

(78) *\([CP \ AP \ likely \ [TP \ t_{Subj} \ [T' \ to_{[\varphi]} \ldots]]] \ [C' \ C \ [TP \ Subj \ [T' \ T_{[\varphi]}] \ [t_{AP}]]]\]
The opposite prediction arises under the control structure. Since the embedded T undergoes Transfer at the stage of (77b), AP movement is allowed.

(79) \([CP \ AP \ t_{Subj} \ [A' \ likely \ [CP \ C \ [TP \ PRO \ [T \ to_{[\varphi]} \ldots]]]] \ [C' \ C \ [TP \ Subj \ [T' \ T_{[\varphi]}] \ [t_{AP}]]]\]
Now, the paradigm in (80) has received an explanation. Since (80b, c) must have a raising structure, AP movement is prohibited by VTS. (80a), by contrast, may involve a control predicate and is successfully derived.
(80)  
  a. How likely to win is John?
  b. *How likely to be a riot is there?
  c. *How likely to be taken of John is advantage? (=42)

Furthermore, our analysis accounts for (81) and (82) in the same fashion.

(81)  
  a. Likely to be assigned to the athletes one translator is.
  b. *Likely to be a man outside there was.
  c. *Likely to be taken of John advantage was. (=60)

(82)  
  a. Likely to be assigned to the athletes though one translator is,
  b. *Likely to be a man outside though there was, ...
  c. *Likely to be taken of John though advantage was, ...
  (=61)

Note that the VTS analysis attributes the ungrammaticality in (80b, c) to the uninterpretable φ-features of T in the moved phrase. Under the current perspective, it will be possible to make these sentences grammatical by removing the uninterpretable φ-features from the moved AP. I argue that Extraposition of infinitives does this job. Since Extraposition of the embedded TP enables the embedded T to escape from AP and remain in the matrix TP, as shown in (83), AP movement is in conformity with VTS.

(83)  
  a. [CP C [TP ... [AP how likely [TP to]...]]]
  b. [CP C [TP ... [TP to]...] ... [AP how likely tTP]]
  c. [CP [AP how likely tTP] [C′ C [TP ... [TP to]...] ...[AP]]]

This explains the acceptability in (84).

(84)  
  a. How likely is there to be a riot?
  b. How likely is advantage to be taken of John? (=49)

Thus, the VTS analysis can explain all of the examples we saw in the previous sections, including the recalcitrant examples for the previous approaches.21, 22

21 One EL reviewer points out that the proposed analysis predicts that (ib) is grammatical, contrary to the fact.

(i)  
  a. There is likely a riot.
  b. *How likely a riot is there?
  c. *How likely to be a riot is there?

Since I have argued that (ic) is ungrammatical due to the presence of to, (ib) is expected to be improved. This prediction is based on the assumption that likely takes a small clause complement in (ia). I would like to argue that (ib) does not pose a serious problem for my analysis by suggesting that this assumption may be wrong. Specifically, I suggest that likely in (ia) is an adverb and does not select a small clause (I assume following Abels (2002) that likely taking an infinitive is an adjective). The adverbial use of likely is shown in (ii).

(ii) There will likely be a riot. (Abels (2002: 7))
In summary, this section has shown that the VTS analysis can accommodate *be likely to* constructions under the motivated raising/control ambiguity. Furthermore, I have added credibility to the VTS-based approach by showing that Extraposition of *to*-infinitives may have an amelioration effect.

7. Conclusion

This paper has examined the following seemingly disparate movement phenomena: the immovability of phasal complements (Abels (2003)), the (im)possibility of VP Topicalization in raising, control, and ECM constructions, the (im)mobility of raising infinitives, small clauses, and control infinitives, and the behavior of *be likely to* constructions. I have demonstrated that a number of contrasts observed in these movement phenomena can be deduced from VTS (Epstein and Seely (2002), Chomsky (2007, 2008)) together with some motivated assumptions.

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If *likely* in (ia) is an adverb, it is reasonable that (ib) is impossible because pied-piping of *a riot* is illegitimate. Furthermore, under the adverb analysis, the unacceptable status of (iii) is also expected, given that the adverbial *likely* does not tolerate being modified by *how* (Abels (2002)).

(iii) *How likely is there a riot?*

(iv) *How likely will John win the race?* (Abels (2002: 8))

22 Boeckx (2002) and Abels (2002) present (i) as evidence for their approach.

(i) a. Who said that John was *how likely* to win?
   b. *Who said that there was how likely to be a riot?*
   c. *Who said that advantage was how likely to be taken of John?* (Boeckx (2002: 45))

(i) shows that even when the predicate raising does not overtly occur, an expletive and an idiom chunk are incompatible with *how likely*. It may be that *how* actually acts as an intervener, as they argue, though this cannot be the whole story (see (60) and (61)). Alternatively, if we could demonstrate that the predicate undergoes syntactic movement, but is pronounced in its launching site, (i) is explicable by the VTS analysis. I leave the matter open.


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