The Vacuous Movement Hypothesis, the VP-internal Subject Hypothesis, and the Theory of Feature Inheritance
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1. Introduction

The vacuous movement hypothesis (henceforth, VMH), which prohibits a movement operation from having no effect on PF output, conflicts with the accepted VP-internal subject hypothesis (VPISH) (cf. Fukui and Speas (1986), Kitagawa (1986), Kuroda (1988), etc.), which forces a subject originated within Spec-v* to move vacuously to Spec-T for the purpose of feature-checking. A serial work in the literature (cf. Agbayani (2006), Chomsky (1986), George (1980), etc.) has elaborated the VMH, discussing movement of wh-subjects from Spec-T to Spec-C, but it has not considered the conflict between the VMH and the VPISH. In this paper, I attempt to reconcile this conflict, making the following claims: (i) edge features on C can be inherited to T, but not to v*, so that wh-subjects move from Spec-v* only to Spec-T, and (ii) movement from Spec-v* to Spec-T, though producing no effect on PF output, is not vacuous because it is properly feature-motivated at narrow syntax. These claims are made by reformulating the hitherto known VMH, in perspective of the system of feature inheritance (Chomsky (2008)).

This paper is organized as follows. Section 2 inspects the VMH as presented by Chomsky (1986) and points out its empirical and theoretical problems. Section 3 proposes an alternative version of the VMH, which is based on the theory of feature inheritance, and displays its consequences. Section 4 considers additional consequences and implications of the proposed analysis. Section 5 provides a brief conclusion.

2. A Previous Study: Chomsky (1986)

Chomsky (1986:49-50) formulates the VMH as follows:

(1) Vacuous movement is not obligatory at S-structure.

This formulation means that, whenever vacuous movement is banned at S-structure,
it must be applied at LF. Consider, for instance, the cases in (2), involving *wh*-movement.

(2) a. Who saw John?
   b. Who did John see?

In (2a), movement of the *wh*-subject to Spec-C, if any, can only be applied vacuously, inducing no effect on PF output. This is different from the nonsubject case in (2b), where the *wh*-phrase moves from object position to Spec-C. The VMH in (1) thus prevents *wh*-subjects from moving to Spec-C at S-structure. This is supported by the fact that *wh*-island effects are removed in *wh*-subject constructions, as observed in (3)-(4).

(3) What do you wonder [who saw t]?
(4) a. He is the man to whom, I wonder [who knew [which book to give t]].
   b. He is the man to whom, I wonder [who John told [which book to give t]].

Sentences (3) and (4a) are more acceptable than (4b). This difference in acceptability emerges from the VMH. The former includes *wh*-movement from within the *wh*-subject island or relativization out of the *wh*-subject island, denoted with the outer bracket. The latter, on the other hand, involves relativization from the nonsubject *wh*-island, expressed by the outer bracket. If *wh*-subjects remain in situ at S-structure along the line in (1), only embedded Spec-C in the former would serve as an escape hatch for successive-cyclic movement. This expectation is endorsed by the contrast in acceptability between (3)/(4a) and (4b).

As stated above, Chomsky’s version of the VMH entails LF-movement of *wh*-subjects to Spec-C, which satisfies category-selectional properties of verbs such as *wonder*. The existence of this sort of movement is independently borne out by the case in (5), which exhibits a superiority effect.

(5) *How, do you wonder who fixed the car t?*

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1 Chomsky does not mean with the formulation in (1) that vacuous movement applies optionally at S-structure.
2 Chomsky mentions acceptability for (3)-(4) only in the text, so I do not assign any judgment mark to these sentences.
3 Agbayani (2006) and Richards (2001), contra Chomsky (1986), treat examples like (3) as deviant. Considering the picture, this paper keeps an attitude to *wh*-subject island cases neutral in the later discussion.
If the wh-subject who stays in situ at LF, this sentence should be impeccable with $t$ properly governed by the intermediate trace of how in embedded Spec-C, contrary to fact. Chomsky (1986:49) reduces this unacceptability to an ECP violation. That is, LF-movement of who to embedded Spec-C eliminates the intermediate trace of how, rendering proper government of $t$ impossible, hence an ECP violation.

The VMH as seen above raises some empirical and theoretical problems. Let us first consider the ban on local topicalization, given by Lasnik and Saito (1992) and later discussed by Agbayani (2000, 2006) in the context of the VMH.

(6)  
- a. Johni thinks that himself$_i$, Mary likes $t_i$.
- b. *John$_i$ thinks that himself$_i$, $t_i$ likes Mary.

The anaphor himself in (6a), which is topicalized from object position in the embedded clause, can take the matrix subject John as its antecedent. As shown in (6b), on the other hand, topicalization from subject position yields a Condition A violation. This indicates that himself in (6b) is not in a topicalized position, which himself in (6a) occupies, at LF; otherwise, this sentence should have the same status as (6a) with respect to Condition A. This cannot be predicted by the VMH in (1), because it forces himself in (6b) to be raised to a topicalized position at LF, staying in situ at S-structure.

Second, observe other vacuous movement contexts, containing coordinate structures, discussed by George (1980).

(7) They removed the prisoner, who(m) the judge has sentenced and (who(m)) the warden will execute.

(8)  
- a. They removed the prisoner, who has lost his appeal and *(who(m)) the warden will execute.
- b. They removed the prisoner, who(m) the judge has sentenced and *(who) will now appeal.

(9)  
- a. Here is the prisoner who ratted on the punk and *(who) Foley said was torched.
- b. Here is the prisoner who(m) you saved and (who) Foley said should be torched.

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4 This paper takes a topicalized element to be in a CP domain (cf. Rizzi (1997)). This emerges from the assumption that where Condition A is applicable to an element is in the least phase domain containing it (cf. Arimoto and Murasugi (2005)). If the topicalized anaphor in (6a) occupies the TP-adjoined position, which is in the lower phase domain, as Lasnik and Saito (1992) assume, then the element should not be bound by the matrix subject, which is in the higher phase domain, contrary to fact.
A coordinate structure requires parallelism between its conjuncts in every respect (cf. Bošković and Franks (2000), Goodall (1987), Ross (1967), etc.). An instance of this is shown in (7), whose conjuncts allow for across-the-board movement of the wh-phrases. This is because each of the first and second conjuncts has the wh-phrase that undergoes extraction to the parallel position, Spec-C (see George (1980:section 5.3)). If subject wh-phrases are always raised to the specifier position of CP at LF, as Chomsky (1986) assumes, then every coordinate structure, including (derived) wh-subjects in one conjunct and any wh-phrases in the other, should permit across-the-board extraction, satisfying parallelism at LF. This is not the case, however, as is obvious from the sentences in (8)-(9). Where across-the-board movement is viable under such a structure is only in (9b), which contains the wh-object in the first conjunct and the derived wh-subject in the second.

Third, there is evidence that category-selectional properties of verbs do not have to be satisfied at LF, given by Furukawa and Fukuda (2009) (see also Grimshaw (1979)).

(10) I wonder [who saw what].  
    b. Who wondered [what John saw]?

(Furukawa and Fukuda (2009:271))

As Chomsky (1986) states, if the category-selectional property of wonder in (10) can be fulfilled by LF-movement of who to Spec-C, it would not be clear why sentence (11a) gains no acceptable status, with what raised to embedded Spec-C at LF, and why only sentence (11b), where what is raised overtly to embedded Spec-C, is acceptable.

Fourth, consideration of the clausal typing hypothesis (Cheng (1991)), indicated in (12), also makes Chomsky’s analysis undermined.

(12) A wh-element or a particle must be present in CP to type a wh-question.

According to Cheng, clausal typing is a property to be met at S-structure. If it were satisfied at LF, it would lead to a wrong prediction that there exists a language which forms a question with a particle inserted covertly into C (cf. Agbayani (2006:90)). This argues against LF-movement of wh-subjects to Spec-C.

Finally, the VMH should be redefined under the VPISH, with which I am more concerned in this paper. In the literature, including Chomsky (1986), discussion on vacuous movement has often focused on movement from Spec-T to
Spec-C (cf. Abe and Hornstein (2010), Agbayani (2000, 2006), George (1980), Mikami (2010), etc.), but not on movement from Spec-v* to Spec-T, under the VPISH. Generally, subjects have been regarded as obligatorily raised from Spec-v* vacuously to Spec-T for the purpose of feature-checking. It is thus significant to construct a theory that reconciles the VMH with the VPISH.

To wrap up this section, Chomsky (1986) proposes the VMH in (1), according to which wh-subjects remain overtly in Spec-T but move covertly to Spec-C, fulfilling category-selectional properties of verbs. I have argued that this version of the VMH is not bolstered up both empirically and theoretically, and, in addition, should be reformulated postulating the VPISH. In section 3, I offer an alternative version of the VMH, bearing these in mind.

3. Proposal
3.1. Theoretical Assumption

The framework that I adopt in this paper is Chomsky’s (2008) theory of feature inheritance. In this framework, Agree features (AFs), which are inherited from C to T, and edge features (EFs) yield A-movement and A’-movement, respectively. This is exemplified in (13).

\[(13) \quad \begin{align*}
    a. & \quad \text{Who did John see?} \\
    b. & \quad [\text{CP Who} [\text{TP John} [v^{*}P <\text{John}> \text{see} <\text{who}>]]]
\end{align*}\]

In (13b), the derivation for (13a), the inherited AF triggers movement of the subject DP to Spec-T, and the EF of C raises the wh-phrase to Spec-C.

This approach to movement seems to be plausible as far as object wh-questions are concerned, but subject ones make it opaque. Consider the following:

\[(14) \quad \begin{align*}
    a. & \quad \text{Who saw John?} \\
    b. & \quad [\text{CP Who} [\text{TP } <\text{who}> [v^{*}P <\text{who}> \text{saw John}]]]
\end{align*}\]

The derivation for (14a) in (14b), which is based on Chomsky (2008), illustrates that

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5. This argument forces the ECP account of (5) to be replaced by some alternative. However, it is now uncertain as to what that is. This is thus left for future investigation.

6. This view settles a long-standing question why ECM-infinitival T fails to value Nominative on the closest DP. Specifically, ECM-infinitival T lacks C, which has an AF, and thus, the closest DP cannot be assigned Nominative. Furthermore, feature inheritance has a theoretical advantage in that it is in conformance with the “strong minimalist thesis” (see Chomsky (2004, 2008) and Richards (2007) for details).
each copy of *who* originated in Spec-\(v^*\) is raised to Spec-T, due to the inherited AF, and to Spec-C, owing to the EF of C. Although this derivation enables us to capture the parallelism in derivation between object and subject *wh*-questions, it is unclear whether the latter, which lacks visible *wh*-movement, is actually associated with such a derivation. In section 3.2, I claim, instead, that the subject *wh*-question in (14a) has its distinct derivation to be chosen, for the existence of an alternative version of the VMH, which draws upon the theory of feature inheritance.

3.2. *Analysis*

Let us begin with the reformulation of the VMH, on the assumption that EFs can be inherited from C to T.\(^7\)

(15) Inheritance of edge features is prohibited by the intervention of syntactic materials.\(^8\)

Given this formulation of the VMH, EFs are inherited from C to T when there is no syntactic intervener between C and T at narrow syntax. With this in mind, let us consider the derivation for (14a).

(16) \([C \left[ \text{TP} \right. \left. \text{Who} \right] \left[ \text{T} \right. \left. \left[ v^* \left[ \text{who} \right] \left[ v^* \left[ \text{saw John} \right] \right] \right] \right] \] \]

As given in (16), the subject *wh*-phrase *who* is base-generated within Spec-\(v^*\). Given that operations within phases apply in parallel (see Chomsky (2008)), at the subsequent stage, the AF is inherited from C to T, and, simultaneously, the EF undergoes inheritance from C to T in the absence of any intervener between C and T. The features so inherited trigger movement of *who* just to Spec-T.

However, the sentence in (13a), containing the object *wh*-phrase, is not related with such a derivation. If this sentence undergoes parallel inheritance of the AF and the EF, its derivation would crash because the subject *John* and the object *who*.

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\(^7\) This assumption is suggested by Chomsky (2008:157). Adopting the assumption, Kitada (2010) describes A/A' properties of non-DP subjects, but he does not discuss a question as to what environment results in inheritance of EFs. Although this paper is able to answer the question, based on (15), it is still necessary to consider whether the answer is compatible with Kitada's claim. However, this issue is beyond the scope of this paper and thus left for future work.

\(^8\) The term of 'syntactic materials' entails overt as well as covert elements, namely, copies and PROs (see also note 12). Kunio Nishiyama (personal communication) turned my attention to an issue as to whether adverbials can be an intervener of inheritance, in the light of Bobaljik's (1995) argument that they do not restrict affix hopping, on which linear adjacency is imposed. At this moment, it is not obvious whether this also holds for inheritance of EFs, so the issue is left for future research.
compete against each other, demanding the specifier position of TP. This requires that the sentence work over assembling of its structure, as illustrated in (17).

\[
(17) \quad [\text{CP Who [did+C [TP John [T [v* <John> see <who>]]]]}]
\]

In (17), the subject John moves via the AF to Spec-T, which is in the position between C and T. The moved element blocks inheritance of the EF. It then follows that in this case, the EF, which is on C, attracts the \textit{wh}-phrase who to Spec-C.

Before proceeding to consider in what way the VMH in (15) resolves some empirical and theoretical problems with Chomsky's (1986) analysis, we need to answer an important question of how the VMH is reconciled with the VPISH. In the current context, it is natural to ask whether inheritance of EFs also goes on to \textit{v*} under the VPISH. If this is the case, it follows that in (14a), the \textit{wh}-subject who remains in situ with no movement. The answer is negative, however. The \textit{wh}-subject who is base-generated between T and \textit{v*}. This situation does not allow EFs to be inherited by \textit{v*}. The present version of the VMH thus tolerates movement of \textit{wh}-subjects via feature-checking to Spec-T, adopting the VPISH.

It is also important to note that the analysis proposed here no longer regards movement from Spec-\textit{v*} to Spec-T as 'vacuous,' even though it is 'string-vacuous' movement, which lacks any effect on PF output. This is because the VMH in (15) makes no reference to PF output at all; rather, it is only concerned with local syntactic relations at narrow syntax. It thus follows that this version of the VMH licenses any movement that is motivated by EFs and/or AFs.

Contra the reasoning above, Chomsky (1986) does not provide us with any piece of affirmative, compelling argument that \textit{wh}-subjects undergo movement from Spec-T to Spec-C at LF, in spite of repudiating movement at narrow syntax that should be driven by features on C unless the analysis in this section is adopted.

In this subsection, I have proposed with the VMH in (15) that (i) EFs on C can be inherited to T, but not to \textit{v*}, so that \textit{wh}-subjects move from Spec-\textit{v*} only to Spec-T, and (ii) movement from Spec-\textit{v*} to Spec-T, though producing no effect on PF output, is not vacuous because it is properly feature-motivated at narrow syntax. In section 3.3, I attempt to explain some problems with Chomsky (1986), noted in

\footnotesize{\textsuperscript{9} See Richards (2007) for the independent theoretical evidence that \textit{v*} does not inherit any feature.}

\footnotesize{\textsuperscript{10} In this respect, the VMH in (15) has a “local” formulation in the sense of Collins (1997), who shows that economy conditions should be local rather than global on both empirical and theoretical grounds. Under such a formulation, whether or not some operation applies in a derivation is determined at each step in the derivation. For further details, see Collins (1977).}
section 2, from the view of the proposed version of the VMH.

3.3. **Explanation**

Let us start by considering the question why local topicalization is banned. The relevant examples and their derivations are given below:\(^{11}\)

(18) a. John\(_i\) thinks that himself\(_i\), Mary likes \(t_i\).
   b. *John\(_i\) thinks that himself\(_i\), \(t_i\) likes Mary.

(19) a. John\(_i\) thinks \([\text{CP} \text{ that} [\text{TopP} \text{ himself}\(_i\) [\text{Top} \text{ [TP} \text{ Mary} \text{ [T [likes \text{ <himself\(_i\)> ]]}]}]]]]\]
   b. *John\(_i\) thinks \([\text{CP} \text{ that} [\text{Top} [\text{TP} \text{ himself}\(_i\) [\text{T [v*P \text{ <himself\(_i\)> likes Mary]}]}]))]]\]

In (19a), the specifier position of TP is occupied by the embedded subject Mary, so the EF of Top is not inherited by T.\(^{12}\) The object himself is thus raised via the EF to Spec-Top in the higher phase domain, where it is bound by the matrix subject John. On the other hand, himself in (19b), which is a topicalized subject in the embedded clause, is not bound by John. In this derivation, the EF is inherited by T due to no intervener between Top and T, so himself can only be raised to Spec-T, not to Spec-Top. This position is in the lower phase domain, namely, outside the binding domain of the matrix subject, which is in the higher phase domain. No binding relation thus obtains.

Let us go on to account for the cases in (8) and (9), including vacuous extraction in coordination, repeated as (20) and (21), whose structures are described in (22) and (23).

(20) a. They removed the prisoner, who has lost his appeal and *(who(m)) the warden will execute.
   b. They removed the prisoner, who(m) the judge has sentenced and *(who) will now appeal.

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\(^{11}\) For the purpose of exposition, I assign to the embedded clauses of (18) complex CP structures, which are proposed by Rizzi (1997). Such structures, which involve pragmatic information, should, in effect, be represented at LF, and not at narrow syntax (see also Chomsky (2008)).

\(^{12}\) Note that the derivation in (19a) is parallel with the one in (17), a licit derivation for (13a), in which the simultaneous inheritance of the AF and the EF makes the subject John and the object who scramble for the specifier position of TP, which produces ungrammaticality. This is also true for (18a). If the AF and the EF are inherited in parallel, the subject Mary would compete for Spec-T with the object himself. This ends up being deviant. Thus, sentence (18a) can only be derived as in (19a).
(21)  a. Here is the prisoner who ratted on the punk and *(who) Foley said was torched.
    b. Here is the prisoner who(m) you saved and (who) Foley said should be torched.

(22)  a. They removed the prisoner, [C [TP who [T [v_p <who> has lost his appeal]]] and [CP *(who(m)) [TP the warden will execute <who(m)>]]
    b. They removed the prisoner, [CP who(m) [TP the judge has sentenced <who(m)>]] and [C [TP *(who) [T [v_p <who> will now appeal]]]]

(23)  a. Here is the prisoner [C [TP who [T [v_p <who> ratted on the punk]]] and [CP *(who) [C [TP Foley [T [v_p said [C [TP <who> [T [v_p was torched <who>]]]]]]]]]
    b. Here is the prisoner [CP who(m) [TP you saved <who(m)>]] and [CP (who) [C [TP Foley [T [v_p said [C [TP <who> [T [v_p should be torched <who>]]]]]]]]]

As shown in (22), the first conjuncts are not parallel with the second conjuncts. In (22a), the first conjunct has the wh-subject, which undergoes movement via the inherited EF (and the inherited AF) to Spec-T; contrastively, the second conjunct contains the nonsubject wh-phrase, which is raised to Spec-C by the EF on C. Structure (22b) displays the reverse of this. That is, the first conjunct includes the nonsubject wh-phrase, but the second conjunct the subject wh-phrase. This non-parallelism between the first conjunct and the second conjunct results in the failure of across-the-board extraction.

Structure (23a), which has the wh-subjects in both conjuncts, is not allowed to undergo across-the-board movement. This also comes from the asymmetry between the first conjunct and the second conjunct. The wh-subject in the first conjunct moves via the inherited EF (and the inherited AF) to Spec-T. By contrast, the wh-subject in the second conjunct is a derived one; that is, it is first attracted to embedded Spec-T by the inherited EF (and the inherited AF), and then, it undergoes movement to matrix Spec-C, the intervener Foley blocking inheritance of the EF. This contrast interrupts across-the-board movement. Structure (23b), on the other hand, can undergo across-the-board extraction, involving the wh-object in the first conjunct and the derived wh-subject in the second conjunct. These wh-phrases target at the parallel position (i.e. Spec-C) because each of the materials in Spec-T, you and Foley, prohibits inheritance of the EF. This makes across-the-board movement possible.

What is considered next is about category-selectional properties of verbs. We are now in a position to capture the paradigm in (10)-(11), whose derivations are
depicted as (24)-(25).

(24) I wonder [C [TP who [T [νp <who> saw what]]]]
   b. Who wondered [CP what [C [TP John [T [νp <John> saw <what>]]]]]

In (24), the EF is inherited from C to T in the absence of any intervener. Suppose here that category-selectional properties are satisfied by the checking of EFs. It then follows that the category-selectional property of wonder in (24) is fulfilled by just the movement of who to Spec-T at narrow syntax, with no need for movement at LF, as Chomsky (1986) assumes.

The same supposition also enables us to explain the asymmetric difference in well-formedness between (25a) and (25b). The derivation in (25a) has something to do with the illicit ones for (13a) and (18a), in which the AF and the EF are simultaneously inherited from C to T. In the illicit derivations, the subject competes for Spec-T with the object. The same holds true for (25a). Thus, in (25a), the EF is not properly checked, and, in turn, the category-selectional property of wonder is not satisfied. In contrast to this, derivation (25b) allows the EF to be appropriately checked. In (25b), the AF raises the subject John to Spec-T, and the raised element blocks inheritance of the EF from C to T. As a result, the EF is checked by the object what, whereby the category-selectional property of wonder is fulfilled.

Notice also that the explanation proposed here keeps to Cheng’s (1991) generalization, already seen in (12). That is, overt movement of wh-subjects to Spec-T, instead of Spec-C, establishes clausal typing, under the assumption that clausal typing obtains via the checking of EFs. This renders LF-movement redundant. More specifically, the checking of inherited EFs by overt movement has the same effect as covert movement to Spec-C, as Chomsky (1986) proposes, and thus, the latter is not needed any more.

This subsection has argued that the analysis proposed in section 3.2 is adequate by overcoming some problems with Chomsky’s (1986) analysis. It is shown in section 3.4 that this analysis has additional consequences.

3.4. Consequences

The current analysis gives a principled explanation for the (in)compatibility of parasitic gaps (PGs) with wh-subject constructions, as shown in (26), in tandem with a licensing condition on PGs put forth by Sakamoto (2011).
(26)  a. *a man who \([t \text{ looks old } \text{ whenever I meet } pg]\)
   b. a man who \([\text{ whenever I meet } pg \, t \text{ looks old}]\)

(Sakamoto (2011) argues that PGs are licensed via parallelism between real gap chains and PG chains, following the operator movement analysis proposed by Chomsky (1986). In order to affirm the validity of this analysis, consider the typical PG sentence in (27).

(27) Which article did you file \([_{cp} Op \text{ without PRO reading } pg]\)?

As illustrated in (27), this sentence has two gaps, each of which is denoted by \(t\) and \(pg\). The former, called a "real gap," is created by the movement of the \(wh\)-phrase \(\text{which article}\) to Spec-C, and the latter, referred to as a "PG," is produced by the movement of the null operator \(Op\) to Spec-C (see Chomsky (1986:55-56)). This means that in (27), the real gap chain is parallel with the PG chain, hence the license of the PG.

Keeping this in mind, consider the opposition in acceptability between (26a) and (26b). The analysis offered in section 3.2 assigns to (26) the following structures:

(28)  a. *a man \([C \text{ [TP who } T [_{v*p} <\text{who}> \text{ looks old }] \text{ whenever I meet pg}][_{cp} Op \text{ without PRO reading } pg]\)][\]]
   b. a man \([_{cp} \text{ who } C \text{ [TP [_{cp} Op \text{ whenever I meet } pg] [_{TP} <\text{who}> [T [_{v*p} <\text{who}> \text{ looks old}])))]]\)][\]

In (28a), there is no parallelism in chain formation between the real gap chain and the PG chain. This is because the \(wh\)-subject \(who\), an operator of the real gap, is raised to Spec-T by the inherited EF (and the inherited AF), but the operator of the

13 Movement of null operators, as well as that of \(wh\)-operators, can be regarded as created by EFs. It then turns out from (27) that PRO, occupying Spec-T, prevents the EF from being inherited from C to T, whereby \(Op\) is raised to Spec-C.

14 See Sakamoto (2011) for further details of this analysis.

15 Adjunct clauses (e.g. \(because\) (restrictive), \(when, after, before, since\) (temporal), \(while\) (successive), and \(so that\) (purposive) clauses) can occur out of verbal domains (cf. Nakajima (1982)). Observe the following:

(i) John came here before I arrived, but Mary did so after I arrived.

As observed in (i), adjunct clauses can be excluded from verbal domains under \(do\ so\) substitution. I thus assume that the \(whenever\) clause in (28b) is in the TP domain.
PG to Spec-C. Example (26a) does not thus license the PG. Contrastingly, the PG in (26b) is licensed. In (28b), the structure for (26b), the intervention of the *whenever* clause disturbs inheritance of the EF, so the operator of the real gap undergoes movement to the specifier position of CP, which is a parallel position with where the operator of the PG is.\(^{16}\) This yields the acceptability of (26b).\(^{17}\)

In this subsection, I have shown that the proposed analysis also explains the (in)consistency of PGs with wh-subject constructions, in conjunction with the analysis of PGs in Sakamoto (2011). In section 4, I consider further consequences and implications of the present analysis.

4. Further Consequences and Implications

The analysis in the previous section should also be extended to verbal domains (cf. Chomsky (2008)). Put it clearly, the proposed version of the VMH compels EFs on v* to be inherited to V if there is no intervener between them. This has an interesting consequence for superiority effects (cf. Chomsky (1981)), as observed in (29).

\[
\begin{align*}
(29) & \quad \text{a. Who saw what?} \\
& \quad \text{b. *What did who see?}
\end{align*}
\]

The asymmetry in acceptability between these sentences shows that in multiple questions, wh-objects cannot occupy sentence-initial positions, crossing wh-subjects. If the EF on v* is not inherited to V in this case, then expressions such as (29b) should be possible with it attracting *what* to the position closer to C than who, as in (30).\(^{18}\)

\[
(30) \quad C \ldots [v_p \text{what} [v_p \text{who} [v_p \text{saw} [v_p <\text{saw}> <\text{what}>]]]]
\]

\(^{16}\) As described in (28b), this structure also includes the movement of *who* to Spec-T, which independently takes place via the AF inherited by T (see Chomsky (2008)). However, this A-chain so created is irrelevant to the discussion here, so I am refraining from making any reference to it.

\(^{17}\) One might argue that the contrast in (26) is attributed to the anti-c-command condition, according to which PGs may not be c-commanded by real gaps (cf. Chomsky (1986), Engdahl (1983)). Based on its counterevidence, however, I consider that the condition cannot qualify as a licensing condition on PGs (see Brody (1995), Engdahl (1984), Kiss (1985), Sakamoto (2011), etc.).

\(^{18}\) Consideration of multiple questions in German, where no superiority effect is observed, leads Chomsky (2008) to the claim that derivation (30) should be admitted in English. However, I believe that at least English does not have this derivation, because of the VMH in (15). It is now unclear as to where the lack of superiority effects in German stems from, so I leave this issue open for future work.
This is not the case, however. Rather, it is only the derivation in (31), based on my analysis, that is capable of capturing the truth.

\[(31) \quad \text{C} \ldots [v^* \text{who} [v^*+\text{saw} [vp \text{what} [<\text{saw} <\text{what}>]]]]\]

In this derivation, the EF on \(v^*\) is inherited to \(V\) following the VMH in (15). This means that the object \textit{what} is only raised to the specifier position of VP. In the formed configuration, \textit{who}, closer to C, can be the only object for further extraction. The contrast in (29) is a necessary consequence of this.

The present discussion can yield a somewhat radical implication for \textit{wh}-movement, even for the theory of phase (cf. Chomsky (2001, 2004)). Consider, for example, the simple case in (32a) for movement of an object \textit{wh}-phrase, whose derivation is displayed in (32b), based on Chomsky's phase theory.

\[(32) \quad \text{a. What did you play?} \]
\[\text{b. } [cp \text{ What did } [tp \text{ you } [v^*p <\text{what}> [v^*p <\text{you}> [v^*+\text{play} [vp <\text{play}> <\text{what}>]]]]]]\]

As depicted in (32b), under this theory, the \textit{wh}-phrase \textit{what} cyclically reaches via the phase edge of \(v^*\) to Spec-C; otherwise, the derivation would crash because the Transfer domain VP, including \textit{what}, is transferred to the interfaces, with it bearing an uninterpretable feature to be valued in the upper domain.

Given the proposed version of the VMH, however, sentence (32a) must actually be derived as follows:

\[(33) \quad [cp \text{ What did } [tp \text{ you } [v^*p <\text{you}> [v^*+\text{play} [vp <\text{what}> [<\text{play} <\text{what}>]]]]]]\]

In (33), the \textit{wh}-object \textit{what} is first raised to Spec-V in the presence of the EF (and the AF) inherited from \(v^*\) to V, and then, it moves to Spec-C. As just mentioned above, this derivation could not converge since the moved \textit{wh}-phrase is still in the Transfer domain VP with its unvalued uninterpretable feature. However, we can have at least two independent solutions for this derivation to converge: (i) the AF first raises \textit{what} to Spec-V, and then, the raised material prohibits the EF from being inherited from \(v^*\) to \(V\), or (ii) inheritance of the EF sets off a shift of the Transfer domain.

In the former solution, the EF undergoes no inheritance, so \textit{what} can move out the lower Transfer domain, thereby enabling the element to value its uninterpretable feature in the upper domain, in a similar fashion to the one in (32b). According to
the latter solution, on the other hand, complements to heads that receive EFs are qualified as Transfer domains. Then, in (33), the complement to the head V, an inheritor of the EF belonging to $v^*$, serves as a Transfer domain. This makes cyclic movement of $\text{what}$ viable with no crash, avoiding transfer of its unvalued uninterpretable feature in the lower Transfer domain. It should be determined which solution is better by both empirical and theoretical considerations. The determination is left for future investigation.\textsuperscript{19}

5. Conclusion

This paper has reformulated the VMH on the basis of the theory of feature inheritance and reconciled it with the VPISH. This has led us to state that movement, if not yielding any effect on PF output, is licensed as long as it is properly feature-motivated at narrow syntax. This statement would, however, require further consideration in that it argues against the previous perspective on vacuous movement.

References
Arimoto, Masatake and Keiko Murasugi (2005) Sokubaku to Sakujyo (Binding and Ellipsis), Kenkyusha, Tokyo.

\textsuperscript{19} Solution (ii) can pose a problem for explaining the fact in (18b), in which local topicalization is banned. As illustrated in (19b), the derivation for (18b), the EF is inherited from Top to T. If the inheritance shifts the Transfer domain from TP to $v^*P$, then the locally topicalized anaphor in (18b) should be bound by the matrix subject, with both of the elements in the same phase domain (i.e. the matrix phase). This departs from the fact, however. The departure would come either from the fault in solution (ii) or from the inaccuracy in the definition of Condition A. This means that there is no good reason to abandon the solution in (ii) immediately.


Mikami, Suguru (2010) “Eego ni okeru Wh Syugo Koobun: Kopii Riron ni Motoduku Kuuidookasetu Saikoo to Sono Kiketu (The Wh-Subject Construction in English: The Reconsideration of the Vacuous Movement Hypothesis in terms of the Copy Theory of
Movement and Its Consequence),” in the 141st Conference of the Linguistic Society of Japan, Tohoku University.


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