

## Against the Vacuous Movement Hypothesis

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### ABSTRACT

*The Journal of Studies in Language* 39.3, 319-334. This paper aims to prove that the Vacuous Movement Hypothesis (VMH) is not acceptable. Many scholars have claimed that the VMH accounts for some phenomena concerning subject-object asymmetries, *that*-trace effects, and parasitic gap constructions. This paper illustrates that the VMH is problematic on both conceptual and empirical grounds. A new analysis is suggested in order to account for all the examples provided for the VMH. This paper assumes that an interrogative C has an edge feature requiring its specifier to be filled by a *wh*-phrase or an empty operator. Since the Superiority Condition works among the constituents of the relevant kind and overt *wh*-phrases and empty operators are different in kind, either can be attracted by an edge feature. It implies that an interrogative subject can remain in-situ if another constituent can move to CP-Spec, attracted by the edge feature of C. If there is only one *wh*-phrase for occupying CP-Spec, the *wh*-phrase must move to CP-Spec to satisfy the edge feature whether it is a subject or a non-subject. (Kongju National University)

**Keywords:** composed chain, parasitic gap, Phase Impenetrability Condition, Superiority Condition, Vacuous Movement Hypothesis



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본인이 투고한 논문은 다른 학술지에 게재된 적이 없으며 타인의 논문을 표절하지 않았음을 서약합니다. 추후 중복게재 혹은 표절된 것으로 밝혀질 시에는 논문게재 취소와 일정 기간 논문제출의 제한 조치를 받게 됨을 인지하고 있습니다.

### 1. Introduction

Since George (1980) suggested that *wh*-movement takes place except for subjects, many scholars including Chomsky (1986) and Ishii (2004) have claimed that in questions like (1), the subject *wh*-phrase does not move to CP-Spec, remaining in-situ.

- (1) a. Who saw Mary?  
b. I wonder who saw Mary.

This view is referred to as the Vacuous Movement Hypothesis (VMH). It claims that vacuous movement whose effect is not observed should not be allowed.

For a piece of evidence for the VMH, Ishii (2004) gives the following examples, citing Chomsky's (1986: 48) examples.

- (2) a. ?What<sub>i</sub> do you wonder [who saw t<sub>i</sub>]?  
 b. \*What<sub>i</sub> do you wonder [how<sub>j</sub> John could solve t<sub>i</sub> t<sub>j</sub>]?

Ishii claims that the contrast in (2) can be accounted for under the VMH. The derivation of (2a) will be like the following.

- (3) [<sub>CP</sub> What<sub>i</sub> do you wonder [<sub>CP</sub> t<sub>i</sub> [<sub>TP</sub> who saw t<sub>i</sub>]]]

The wh-phrase *what* can move to the embedded CP-Spec on its way to the matrix CP-Spec, because the embedded CP-Spec is not occupied by *who*, which remains in-situ.

Let us next consider the derivation of (2b), which will be like the following.

- (4) [<sub>CP</sub> What<sub>i</sub> do you wonder [<sub>CP</sub> how<sub>j</sub> [<sub>TP</sub> John could solve t<sub>i</sub> t<sub>j</sub>]]]

In (4) *what* cannot move to the embedded CP-Spec on its way to the matrix CP-Spec, because the embedded CP-Spec is occupied by another wh-phrase *how*. Movement of *what* is a violation of successive cyclicity, and thus is not grammatical. But (2a) is not quite perfect. Chomsky claims that this may be due to the fact that at LF *who* moves to the embedded CP-Spec, which is occupied by another wh-phrase.

Chomsky (1986: 58) gives another piece of evidence for the VMH.

- (5) a. ?He's a man that [everyone [who gives presents to e]] likes t.  
 b. \*This is a book that [any man to whom [we'll give e]] will like t.

In Chomsky's (1986) analysis the parasitic gap (pg) construction is assumed to involve empty operator movement. The structure of (5a) will be like the following.

- (6) He's a man [<sub>CP1</sub> OP<sub>i</sub> that [everyone [<sub>CP2</sub> OP<sub>j</sub> [who gives presents to e<sub>j</sub>]]] likes t<sub>i</sub>.

The relative operator *OP* first merged in the object position of *like* moves to CP1-Spec, leaving a real gap. Under the VMH, *who* does not move to CP2-Spec, and the pg operator merged in the object position of *to* can move to CP2-Spec, forming an operator-variable construction. Chomsky claims that the pg is licensed when the chain of the real gap and that of the pg form a composed chain.<sup>1)</sup> (6) is acceptable because the pg is licensed through chain composition.

On the contrary the structure of (5b) will be like the following.

- (7) This is a book [<sub>CP1</sub> OP<sub>i</sub> that [any man [<sub>CP2</sub> to whom<sub>j</sub> [we'll give e<sub>pg</sub> t<sub>j</sub>]]] will like t<sub>i</sub>.

1) Chomsky (1986) suggests that the pg construction should involve a chain independent of the chain of the real gap. If A = (α 1, ..., α n) is the chain of the real gap, and B = (β 1, ..., β n) is the chain of the parasitic gap, the composed chain is (A, B) = (α 1, ..., α n, β 1, ..., β n).

In (7), the pg  $e_{pg}$  cannot move to CP2-Spec, because the position is already occupied by *to whom*. So it is not possible to form an operator-variable construction for the pg. Since there is no way of forming a composed chain, the pg is not licensed. This is the reason (5b) is not grammatical.

These considerations imply that the VMH seems very effective in accounting for the contrast in (2) and (5). The VMH is conceptually very attractive in that it is in accordance with the following Economy Condition cited from Chomsky (1989: 69).

(8) Economy Condition

Derivations and representations ... are required to be minimal, with no superfluous steps in derivations and no superfluous symbols in representations.

This implies that all the operations including movement is done as a last resort. All the derivations have to be established as economically as possible. Since the effect of vacuous movement is not observed, wh-subjects should not move unless something extra requires the movement.

However, the following contrast casts doubt on the validity of the VMH.

- (9) a. He might think [who has done what]?  
 b. Who might he think [has done what]?  
 c. \*What might he think [who has done]? (Radford, 2009: 182)

Given the VMH (9c) is predicted to be grammatical contrary to fact, because the following derivation is allowed.

- (10) [<sub>CP1</sub> What<sub>i</sub> might he think [<sub>CP2</sub> t<sub>i</sub> [<sub>TP</sub> who has done t<sub>i</sub>]]]?

The embedded wh-subject *who* does not move to CP-Spec, and the embedded clause (=CP2) is not a wh-island. So *what* can move to the embedded CP-Spec on its way to the matrix CP-Spec. After all, the deviance of (9c) is enough to doubt the validity of the VMH, and must be attributed to something different like a kind of superiority effect, which will be dealt with in section 3.

The goal of this paper is to prove that the VMH is not acceptable. We will provide an analysis where all the examples suggested for the VMH are dealt with in other ways, suggesting a revised version of the VMH. In section 2, further arguments for the VMH are presented, and a lot of conceptual and empirical problems of these arguments are pointed out in section 3. A new analysis solving these problems is presented in section 4. Section 5 concludes that the new analysis is preferable to the VMH in many respects, even though there still remain some residual problems.

## 2. Further Empirical Arguments for the VMH

Brillman and Hirsch (2016) present three pieces of evidence that wh-subjects remain in TP-Spec, not moving to CP-Spec, whether they are matrix or embedded. First, *do*-support is prohibited in subject questions, but required in

non-subject questions.

- (11) a. Who saw John?  
b. \*Who did \_\_ see John?
- (12) a. \*Who John saw \_\_?  
b. Who did John see \_\_?

Second, parasitic gaps (pgs) are licensed only in non-subject questions, not licensed in subject questions (cf. Engdahl (1983)).

- (13) a. \*Who \_\_ hired Mary [without her talking to \_\_<sub>pg</sub>]? (subject)  
b. Who did Mary hire \_\_ [without talking to \_\_<sub>pg</sub>]? (object)

Third, subject relatives show weaker wh-island effects than non-subject relatives, as illustrated in the following examples cited from Chung and McClosky (1983).

- (14) a. Paul and Stevie were the only ones [who wanted to record that song].  
b. Isn't that the song which Paul and Stevie were the only ones [who wanted to record ~~which~~]?<sup>2)</sup>
- (15) a. Paul and Stevie were the only ones [who George would let ~~who~~ record that song].  
b. \*Isn't that the song which Paul and Stevie were the only ones [who George would let ~~who~~ record ~~which~~].

Brillman and Hirsch (2016) argue, that these phenomena can be naturally accounted for under the VMH. That is, English is a residual V2 language, where wh-movement to CP-Spec in matrix clauses is typically accompanied by T-to-C movement. If *who* in (11) does not move to CP-Spec, it is not surprising that T-to-C movement is not triggered. Since A'-movement is required for the licensing of a parasitic gap (cf. Nissenbaum (2000)), no movement of *who* results in the ungrammaticality of (13a). The contrast between (14b) and (15b) is accounted for in the same way. In (14b), the subject wh-phrase *who* remains in-situ, and so *which* can move successive cyclically through CP-Spec. On the other hand, in (15b) the object wh-phrase *who* moves to CP-Spec, and so *which* cannot move successive cyclically through CP-Spec. This is the reason (15b) is not grammatical.

Another contrast given by Chomsky (1986: 51) further supports the VMH.

- (16) a. ?This is a paper that we need to find someone who understands t.  
b. \*This is a paper that we need to find someone that we can intimidate with t.
- (17) a. This is a paper [<sub>CP</sub> Op<sub>i</sub> that [<sub>IP</sub> we need to find someone [<sub>CP</sub> t<sub>i</sub> [<sub>IP</sub> who understands t<sub>i</sub>]]]]  
b. \*This is a paper [<sub>CP</sub> Op<sub>i</sub> that [<sub>IP</sub> we need to find someone [<sub>CP</sub> Op<sub>j</sub> that [<sub>IP</sub> we can intimidate t<sub>j</sub> with t<sub>i</sub>]]]]

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2) A strikethrough like ~~which~~ is a representation based on the copy theory of Chomsky (2001, 2004). The word with a strikethrough is not pronounced.

(17) shows the derivational process of the sentences of (16). Chomsky considers (16b) as less acceptable than (16a). As shown in (17a), the VMH permits movement of the relative clause operator from *t* first to the Spec of CP, then to its final position, yielding the only weak Complex NP Constraint effect. As shown in (17b), the corresponding derivation is not allowed, since the Spec of CP is occupied by the fronted object of *intimidate*, and thus the expression is less acceptable.

Furthermore, it is argued by Ishii (2004) that given the VMH and the Phase Impenetrability Condition (PIC), *that*-trace effects can be accounted for naturally.

- (18) a. \*Who did you think that \_\_ saw Bill?  
       b. Who did you think \_\_ saw Bill?
- (19) a. \*[<sub>CP</sub> who ... [<sub>VP</sub> who ... [<sub>CP</sub> that [<sub>TP</sub> who saw Bill]]]]  
       b. [<sub>CP</sub> who ... [<sub>VP</sub> who ... [<sub>TP</sub> who saw Bill]]]

(19a) and (19b) represent the derivational process of (18a) and (18b) respectively. Given the VMH *who* remains in-situ without moving to CP-Spec at the end of the embedded CP phase.<sup>3)</sup> It is generally assumed that phase head C and *v* (light verb) have an edge feature (or an EPP-feature). At the end of the matrix *v*P phase, *who* within the embedded TP is not accessible to the matrix light verb *v*, because it is neither the head nor the edge of the previous phase. According to the PIC, in order for an element to be accessible to an operation in the next phase, it must be in an edge position of the previous phase.<sup>4)</sup> That is, the derivation shown in (19a) is not allowed. Ishii claims that this is the reason *that*-trace effects take place.<sup>5)</sup>

Now let us consider the case where there is no overt complementizer. Ishii (2004) assumes, following Bošković (1997), that complements not introduced by overt complementizers are TP. Since TP does not constitute a phase, *who* within the embedded TP is accessible to the matrix light verb *v*. Accordingly the derivation shown in (19b) is allowed. This is the account for the contrast shown in (18) given the VMH.

This account is problematic, however, in that clauses without an overt complementizer must be analyzed as CP. If the embedded clause is TP, not CP in the case of no overt complementizer, as some scholars (cf. Bošković (1997), Doherty (1997), and Ishii (2004)) suggested, it will be possible for the embedded interrogative subject to move directly to the matrix *v*P without violating the PIC. As Erlewine (2017) points out, the following sentence shows that even in the case of no overt complementizer, the embedded *wh*-phrase has to move to the embedded CP-Spec.

- (20) Which picture of himself<sub>i</sub> did Mary tell John<sub>i</sub> [she would buy \_\_]]?

3) Strictly speaking, Ishii (2004) gives a somewhat different structure for the embedded clause of (19). The subject *wh*-phrase *who* originates in the SPEC of *v* and adjoins to the embedded TP like the following.

(i) [<sub>CP</sub> that [<sub>TP</sub> who [<sub>TP</sub> T [<sub>VP</sub> who saw Bill]]]]

It does not matter in the main discussion of this paper whichever structure is adopted.

4) The PIC (adapted from Chomsky (2001)): In phase  $\alpha$  with head H, only H and its edge are accessible to operations outside  $\alpha$ .

5) Erlewine (2017) gives a similar proposal in that in the case of a null complementizer the subject in the embedded TP-Spec directly moves to the matrix CP-spec, without moving through the embedded CP-Spec like the following.

(i) [<sub>CP</sub> Who does [<sub>TP</sub> Bill think [<sub>CP</sub> Ø [<sub>TP</sub> who saw John]]]]?

But Erlewine's proposal is different from Ishii's. The reason the interrogative subject does not move to CP-Spec is due to cyclic linearization suggested by Fox and Pesetsky (2005), not due to the VMH.



fashion. If *who* moves to CP2-Spec at the end of the embedded CP phase as in (23b), *who* is outside of the domain of the embedded phase head C, and thus can move to CP1-Spec attracted by the edge feature of the matrix phase head C. After all, the VMH is at odds with the PIC. If Chomsky's PIC is correct, the VMH must be rejected.

Second, as mentioned in section 1, if interrogative subjects do not move to CP-Spec, the sentence (9c), repeated here as (24a), will be predicted to be grammatical, contrary to fact.

- (24) a. \*What might he think who has done?  
 b. [<sub>CP</sub> What might [<sub>TP</sub> he think [<sub>CP</sub> what [<sub>TP</sub> who has done what]]]]

(24b) shows the representation where *who* is in TP-Spec. Since *who* does not move to CP-Spec, the embedded clause is not a wh-island, and cyclic movement through the embedded CP-Spec of *what* as in (24b) will be allowed. The movement like this must not be allowed, however, because the sentence is not grammatical. It is claimed that (24a) is ungrammatical due to a condition like the following.

(25) Superiority Condition<sup>9)</sup>

Out of the two wh-phases of the relevant kind, an external probe attracts the higher one in structure before the lower one.

If the Superiority Condition is correct, the ungrammaticality of (24a) is naturally accounted for. Since *who* first moves to the embedded CP-Spec, *what* cannot move to the embedded CP-Spec on its way to the matrix CP-Spec. (24a) is a violation of successive cyclicity.

Now reconsider the derivation of (2a). Given the Superiority Condition, the derivation like (3) is not allowed, because the wh-subject *who* first moves before *what* due to the Superiority Condition. Later movement of *what* violates successive cyclicity because the embedded CP is a wh-island. (2a) is regarded as almost unacceptable even though it is a little bit better than (2b).

Third, the following Irish English examples work against the VMH.

- (26) a. Who was throwing stones all around Butchers' Gate?  
 b. \*They were throwing stones all around Butchers' Gate. (McCloskey, 2000: 77)

An immediate question that arises here is "what is the position the interrogative subject *who* occupies, CP-Spec or TP-Spec?" What is clear from the contrast between (26a) and (26b) is that *who* is in CP-Spec. If *who* is in TP-Spec, the contrast would be indistinguishable. According to McCloskey, (26b) is ruled out due to improper movement of *they* from an A'-position to an A-position. (For the more detailed explanation for this movement, consult McCloskey (2000).) If *who* in (26a) moves to TP-Spec in the same fashion, this movement will be improper as well, resulting in ungrammaticality. This problem is avoided by the direct movement of *who* to CP-Spec when C is introduced.<sup>10)</sup> This is

9) This is the same condition as the Attract Closest Condition suggested by Radford (2009: 183): A head which attracts a given kind of constituent attracts the closest constituent of the relevant kind.

the reason (26a) is accepted. Whatever the proper explanation for the contrast may be, the crucial point is that interrogative subjects have to move to CP-Spec. As long as the subject *wh*-phrase remains in-situ, there is no way to explain the contrast.

Fourth, the following sentence further supports the argument that interrogative subjects move to CP-Spec.

- (27) a. Who, for all intents and purposes, \_\_\_ was the mayor of the city?  
 b. Who, under no circumstances, \_\_\_ would run for president?

Following a refined structure similar to the articulated CP structure suggested by Rizzi (1997), many scholars tried to solve the adverb effect alleviating *that*-trace effects.<sup>11)</sup> Whatever the refined structure of the sentence in (27a) may be, it is clear that adverbials like *for all intents and purposes* in (27a) intervene between CP-Spec and TP-Spec. It implies that the interrogative subject *who* moves from TP-Spec over the intervening adverbial to CP-Spec. The position which the intervening adverbial occupies can be analyzed to be FocusP-Spec, TopicP-Spec, or CP-Spec according to the structure each scholar suggests for C-domain. Whatever the position is, we have to admit that *who* moves from TP-Spec to a peripheral position like CP-Spec.

A fundamental question to be raised here is what triggers *wh*-movement. Chomsky (2001, 2008) suggests that an edge feature [EF] is the mechanism which drives movement of *wh*-phrases to CP-Spec. He maintains that C in questions carries an [EF] requiring a CP projection containing a specifier on the edge of CP. So questions in English are to obey the following condition.

- (28) Interrogative Condition (IC, cited from Radford (2009: 161))

A clause is interpreted as a non-echoic question iff it is a CP with an interrogative specifier.

If the IC is correct, interrogative phrases must move to CP-Spec attracted by an [EF]. Let us consider how the following question is derived.

- (29) a. I wonder who you like.  
 b. I wonder [<sub>CP</sub> who [EF] [<sub>TP</sub> you like ~~who~~]].

The [EF] carried by C will attract a *wh*-phrase to CP-Spec for the satisfaction of its requirements as in (29b). Once a *wh*-phrase moves to CP-Spec, the [EF] is deleted (deletion being indicated by ~~striketrough~~). After all, C in questions has an [EF], which drives movement of *wh*-phrases. It implies that even subject *wh*-phrases have to move to CP-Spec

10) This is problematic in that the EPP of T is not satisfied because TP-Spec is not occupied. One way of overcoming this problem is to resort to parallel movement suggested by Chomsky (2008). The mechanism of parallel movement will be specified later.

11) Intervening adverbs obviate or alleviate *that*-trace effects, as illustrated by the following examples. This is called the adverb effect called by Culicover (1993).

(i) \*Who did John say that ran to the store?

(ii) Who did John say that fortunately ran to the store?

Various accounts for the effect have been offered in Brillman and Hirsch (2016), Browning (1996), Culicover (1993), Douglas (2017), and Erlewine (2017).



for the satisfaction of the [EF]'s requirements.

If questions in English obey the IC, it implies that not only *wh*-questions but also yes-no questions are CPs with an interrogative specifier. Let us consider the following yes-no question.

- (30) Is it raining?

In yes-no questions there is no overt interrogative specifier. So we have to assume that yes-no questions contain a null yes-no question particle which is directly merged in CP-Spec. The assumption is supported by Elizabethan English examples cited from Radford (2009: 164).

- (31) a. Whether had you rather lead mine eyes or eye your master's heels?  
b. Whether dost thou profess thyself a knave or a fool?

The difference between Elizabethan English and present-day English is that questions in the former are introduced by the overt complementizer *whether* whereas those in the latter are introduced by a null counterpart of *whether*.<sup>12)</sup>

The VMH is at odds with the IC. With the IC in mind, which specifies that a clause is interpreted as a question if it is a CP with an interrogative specifier, let us consider the following matrix question.

- (32) a. Who loves Mary?  
b. [<sub>CP</sub> who [EF] [<sub>TP</sub> ~~who~~ loves Mary]]  
c. [<sub>CP</sub> [EF] [<sub>TP</sub> who loves Mary]]

Given IC, the interrogative subject *who* has to move to CP-Spec as in (32b). The [EF] of C can be deleted by CP-Spec being filled by an interrogative phrase. The VMH evokes a problem in that the [EF] of C cannot be deleted, because *who* remains in-situ. In order to avoid this problem, it must be admitted that interrogative subjects move to CP-Spec, not in accordance with the VMH.

Movement to CP-Spec of *wh*-subjects can be objected to in that movement from TP-Spec to CP-Spec is too local or short. Some scholars including Bošković (1997), Grohmann (2011), and Ishii (2004) suggested that there must be a lower bound in movement distance in addition to an upper bound. That is, movement must not be too local or short. This idea is called anti-locality. On the basis of this anti-locality hypothesis Erlewine (2017) argues that A'-movements have to obey anti-locality, and that given anti-locality *that*-trace effects can be accounted for naturally.

- (33) a. \*Who does Bill think that \_\_\_ saw John?  
b. Who does Bill think that John saw \_\_\_?  
(34) a. [<sub>CP1</sub> who ... [<sub>CP2</sub> ~~who~~ that [<sub>TP</sub> ~~who~~ saw John]]]  
b. [<sub>CP1</sub> who ... [<sub>CP2</sub> ~~who~~ that [<sub>TP</sub> John [<sub>VP</sub> saw ~~who~~ ]]]]

12) More evidence is given in Radford (2009) for the possibility that yes-no questions in present-day English have the same syntax as in Elizabethan English except for the type of a complementizer.

Since movement must be successive-cyclic, *who* in (33a) moves from TP-Spec to CP2-Spec, and next to CP1-Spec as shown in (34a). The first step from TP-Spec to CP2-Spec is too short and is ruled out by the anti-locality condition. On the contrary *who* in (33b) moves from within vP to CP2-Spec, and next to CP1-Spec as shown in (34b). The first step from within vP to CP2-Spec is not too short and is accepted. Erlewine argues that this is the reason the subject-object asymmetry regarding the overt complementizer *that* appears.

Erlewine (2017) suggests the following Spec-to-Spec Anti-Locality to make the concept “too local” clear.

(35) Spec-to-Spec Anti-Locality (SSAL)

A'-movement of a phrase from the specifier of XP must cross a maximal projection other than XP. Movement from position  $\alpha$  to  $\beta$  crosses  $\gamma$  if and only if  $\gamma$  dominates  $\alpha$  but does not dominate  $\beta$ .

(36) Crossing

Movement from position  $\alpha$  to position  $\beta$  crosses  $\gamma$  if and only if  $\gamma$  dominates  $\alpha$  but does not dominate  $\beta$ .

The SSAL rules out the movement like (37a).

(37) a. \*[<sub>CP</sub> *who* [<sub>C'</sub> C [<sub>TP</sub> *who* ... ]]]

b. [<sub>CP</sub> *who* [<sub>C'</sub> C [<sub>TP</sub> ... [<sub>VP</sub> ... *who*]]]]

The movement from TP-Spec to CP-Spec in (37a) crosses no maximal projection (MP, henceforth) other than TP, not following the SSAL. However, the movement of *who* in (37b) obeys the SSAL because there is another MP (=TP) other than VP.

Anti-locality (that is, the SSAL) is in accordance with the VMH in that both the SSAL and the VMH rule out movement of interrogative subjects from TP to CP. As long as the SSAL is correct, movement of interrogative subjects from TP to CP cannot be accepted.

Kim (2023) suggests, however, that the problem of violating anti-locality can be avoided if parallel movement suggested by Chomsky (2008) is adopted. Chomsky (2008) proposes a new approach about interrogative subject movement.

(38) a. Who saw John?

b. [ C [ T [<sub>VP</sub> *who* [<sub>VP</sub> see John]]]]

c. [<sub>CP</sub> *who*<sub>i</sub> C [<sub>TP</sub> *who*<sub>j</sub> T [<sub>VP</sub> *who*<sub>k</sub> [<sub>VP</sub> see John]]]]

↑                    ↑

d. [<sub>CP</sub> *who*<sub>i</sub> C [<sub>TP</sub> *who*<sub>j</sub> T [<sub>VP</sub> *who*<sub>k</sub> [<sub>VP</sub> see John]]]]

↑                    ↑

If T and C are merged at the end of vP phase, the structure like (38b) is derived. Chomsky (2008) suggests that the derivation proceeds like (38d), not like (38c). That is, the agreement feature that T inherits from C raises *who* to TP-Spec, and the edge feature of C raises *who* to CP-Spec, simultaneously. All the other copies of *who* except for the

one in the highest position are not pronounced. After all, there is a direct relation between  $who_i$  and  $who_k$ , and between  $who_j$  and  $who_k$ , but there is no direct relation between  $who_i$  and  $who_j$ . If this kind of parallel movement is correct, there is no direct movement from TP-Spec to CP-Spec. Given parallel movement, subject movement to CP-Spec does not violate the SSAL.

To summarize, the VMH evokes many conceptual and empirical problems. It must be concluded that interrogative subjects move to CP-Spec. Parallel movement suggested by Chomsky makes it possible for wh-subjects to move to CP without violating anti-locality.<sup>13)</sup>

## 4. New Analysis

Once the VMH is rejected, now we are in a position to answer how the examples considered as evidence for the VMH can be accounted for. First, subject-auxiliary inversion (SAI) takes place in non-subject questions, but not subject questions.

- (39) a. Who will Mary see?  
b. Who will see Mary?

If we assume, following Pesetsky and Torrego (2001), and Radford (2009), that an interrogative C carries a tense feature [TNS] triggering auxiliary inversion (that is, T-to-C movement) only in matrix clauses, the derivation of (39a) will be like the following.

- (40) [<sub>CP</sub> who [<sub>C</sub> will] [<sub>TP</sub> Mary ~~will~~ see ~~who~~]]  
[EF][TNS]

(40) shows that the [EF] of an interrogative C triggers movement of a wh-phrase to CP-Spec, and that the [TNS] triggers movement of an auxiliary. Both [EF] and [TNS] are deleted with wh-phrase movement and auxiliary movement respectively. However, movement of wh-subjects to CP-Spec suppresses the possibility of T-to-C movement. The derivation of (39b) is represented in the following.

- (41) [<sub>CP</sub> who C [<sub>TP</sub> ~~who~~ will see Mary]]  
[EF][TNS]

Here T-to-C movement does not take place unlike in movement of non-wh-subjects. It is notable that movement of wh-subjects suppresses the T-to-C movement. Pesetsky and Torrego (2001) argue that “a preverbal subject with relevant A’-features is capable of satisfying the needs of both of C’s probes at once.” Following this idea, we suggest

13) Kim (2023) further argues that anti-locality is problematic in many respects. Consult more specific empirical and conceptual evidence against anti-locality (i.e., the SSAL) given by him.

that both distinct probing features of C ([EF] and [TNS]) can be satisfied and deleted simultaneously by movement of wh-subjects to CP-Spec. In other words wh-subjects have matching features corresponding to both [EF] and [TNS] of C, because nominative case is the uninterpretable counterpart of tense. On the contrary, non-wh-subjects have a matching feature corresponding to only [EF]. Accordingly in subject questions two distinct probing features of C ([EF] and [TNS]) attract only one goal (the wh-subject), and in non-subject questions they attract two different goals (the non-wh-subject and T) respectively. This is the reason T-to-C movement does not take place in subject questions.

The idea that wh-subjects have a matching feature corresponding to [TNS] of C is further supported by the following examples from Belfast English (cited from Pesetsky (2017)).

- (42) a. What did Mary claim [did they steal \_\_\_]?  
       b. Who did John say [did Mary claim [had Sue feared [would Bill attack \_\_\_]]?  
 (43) a. Who do you think [(that) \_\_\_ left]?  
       b. \*Who did John say [(did) \_\_\_ go to school]?

In the Belfast English dialect studied by Henry (1995), successive-cyclic wh-movement triggers T-to-C movement when *that* is absent in an embedded clause, as the examples in (42) show. The examples in (43) illustrate, however, that when a subject is extracted from an embedded clause, wh-movement does not trigger T-to-C movement even though it shows the *that*-trace effect. This phenomena can be accounted for by the proposal that only wh-subjects have a matching feature corresponding to [TNS] of C. Movement of wh-subjects satisfies [TNS] of C in addition to [EF] of C and thus makes T-to-C movement unnecessary.

Second, let's go back to the discussion of parasitic gap (pg) constructions mentioned in Brillman and Hirsch (2016). For convenience of discussion the examples of (13) are repeated here as (44).

- (44) a. \*Who \_\_\_ hired Mary [without her talking to \_\_\_pg]? (subject)  
       b. Who did Mary hire \_\_\_ [without talking to \_\_\_pg]? (object)

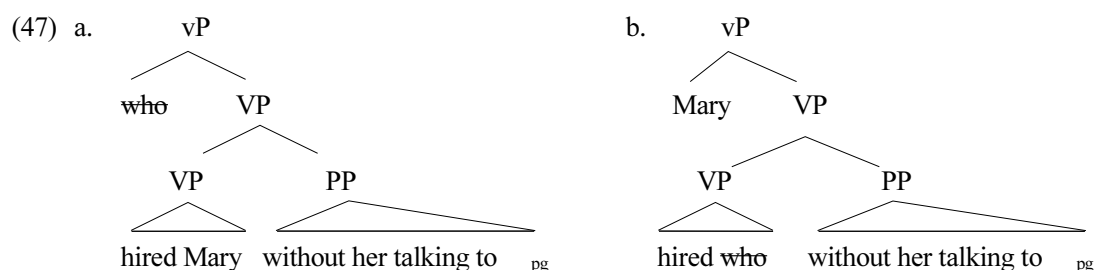
How can the contrast in (44) be accounted for? The examples from Engdahl (1983: 20) illustrate that all interrogative subjects do not license a pg.

- (45) a. \*Which articles \_\_\_ got filed by John without him reading \_\_\_pg?  
       b. \*Who \_\_\_ sent a picture of \_\_\_pg?  
       c. \*Who \_\_\_ remembered talking to \_\_\_pg?

If questioned matrix subjects do not move, and consequently don't leave gaps, as Brillman and Hirsch (2016) argue, the subject-object asymmetry can be accounted for by whether overt movement occurs or not. That is, only interrogative objects moving overtly license a pg. The explanation does not work, however. Even when there is an overt wh-movement like (46), which questions a subject even though it is non-matrix, the pg construction is still not possible.

(46) \*Which articles did you say \_\_ got filed by John without him reading \_\_<sub>pg</sub>?

After all, the subject-object asymmetry in pg constructions has to be rather accounted for by a difference in c-command relation between a real gap and a pg, as Engdahl (1983) suggests. Consider this difference in structure. The structures (a partial relevant structure only) of (44a) and (44b) would be like (47a) and (47b) respectively.



There is a restriction between a real gap and a pg that the former not c-command the latter. In (47a) *who* (the real gap) c-commands the pg whereas in (47b) *who* does not. This is the reason only a real object gap licenses a pg.

However, the restriction in pg constructions cannot be dubbed a subject-object asymmetry. There are cases where even a real subject gap licenses a pg like the following.

(48) Which caesar did Brutus imply \_\_ was no good while ostensibly praising \_\_<sub>pg</sub>?

(46) and (48) differ with respect to the structural relation between a real gap and a pg. This difference is shown in the following bracketed representation (adapted from Engdahl (1983: 21)).

- (49) a. \*Which articles did you say [<sub>CP</sub> \_\_ got filed by John [without him reading \_\_<sub>pg</sub>]]?  
 b. Which Caesar did Brutus imply [<sub>CP</sub> \_\_ was no good] [while ostensibly praising \_\_<sub>pg</sub>]?

In (49a) the real subject gap c-commands everything within the embedded clause including the adjunct phrase containing the pg. In (49b), on the other hand, the real gap does not c-command the pg because the *while* clause is outside the embedded clause. Conclusively speaking, what is crucial in pg constructions is whether the real gap c-commands the pg or not. This has nothing to do with overt movement of interrogatives, unlike Brillman and Hirsch's claim.

Now let us consider Chomsky's (1986) examples presented for evidence for the VMH (repeated here as (50)).

- (50) a. ?He's a man that [everyone [who gives presents to e]] likes t.  
 b. \*This is a book that [any man to whom [we'll give e]] will like t.

Chomsky's account for the contrast in (50) is based on the VMH. The derivation of examples of (50) is like the following.

- (51) a. He's a man [<sub>CP1</sub> OP<sub>i</sub> that [everyone [<sub>CP2</sub> OP<sub>j</sub> [who gives presents to e<sub>j</sub>]] likes t<sub>i</sub>.  
 b. \*This is a book [<sub>CP1</sub> OP<sub>i</sub> that [any man [<sub>CP2</sub> to whom<sub>j</sub> [we'll give e<sub>pg</sub> t<sub>j</sub>]] will like t<sub>i</sub>.

Chomsky claims that the pg is licensed when the chain of the real gap and that of the pg form a composed chain. In (51a), the chain of the pg is formed, because *who* remains in-situ under the VMH and the empty operator moves to CP-Spec. On the contrary no chain of the pg can be made in (51b). After all, (50b) is not acceptable because the pg is not licensed through chain composition.

Now what is crucial is to find a mechanism by which *who* remains in-situ without the VMH. We assume, following Chomsky's (1986) proposal, that the pg construction involves empty operator movement. It is also assumed that the [EF] of C requires the SPEC of CP to be occupied by a wh-phrase or an empty operator, and that a wh-phrase and an empty operator are different in kind because the former has phonological features and the latter does not. Please remind that neither a wh-phrase nor an empty operator blocks movement of the other, because they are different in kind. The underlined part of (50a) will be like the following.

- (52) a. [<sub>CP</sub> C[EF] [who gives presents to Op]]  
 b. [<sub>CP</sub> who C[EF] [who gives presents to Op]]  
 c. [<sub>CP</sub> Op<sub>j</sub> C[EF] [who gives presents to e<sub>j</sub>]]

The [EF] of C requires the SPEC of CP to be occupied. Here there are two candidates for occupying the CP-Spec: *who* and *Op*. We claim that *who* and *Op* are constituents of different kinds, because *who* has phonological features and *Op* does not. So either one can move to CP-Spec attracted by [EF], like (52b) or (52c). Out of the two possibilities only (52c) is adopted because the derivation like (52b) does not make the chain of the pg. After all, even if we do not accept the VMH, the contrast shown in (50) can be naturally accounted for under the assumption that overt wh-phrases and empty operators are of different kinds.

With this consideration in mind, let us reconsider the contrast of the examples in (16) from Chomsky (1986: 51), repeated here as (53).<sup>14)</sup>

- (53) a. ?This is a paper that we need to find someone who understands.  
 b. \*This is a paper that we need to find someone that we can intimidate with.

(53a) is more acceptable than (53b). The derivations of (53a) and (53b) are represented in (54a) and (54b) respectively.

- (54) a. ?This is a paper [<sub>CP1</sub> Op<sub>i</sub> that we need someone [<sub>CP2</sub> Op<sub>i</sub> [<sub>TP</sub> who understands Op<sub>i</sub>]]]  
 b. \*This is a paper [<sub>CP1</sub> Op<sub>i</sub> that we need someone [<sub>CP2</sub> Op<sub>j</sub> that [<sub>TP</sub> we can intimidate Op<sub>j</sub> with Op<sub>i</sub>.]]]

In (54a) CP2-Spec can be occupied by the empty operator *Op<sub>i</sub>*. That is, *who* does not block movement of *Op<sub>i</sub>*, because *who* and *Op<sub>i</sub>* are different in kind in terms of the Superiority Condition. In (54b) *Op<sub>i</sub>* and *Op<sub>j</sub>* are of the same kind, and

14) A variety of phenomena including these examples were first discussed by Chung and McCloskey (1983).

$Op_j$  is superior to  $Op_i$ .<sup>15)</sup> Thus only the former can move to CP-Spec2 according to the Superiority Condition. Movement of  $Op_i$  to CP1-Spec violates the successive cyclicity and results in ungrammaticality of (54b).

## 5. Conclusion

Many scholars have claimed that the VMH must be accepted to account for some phenomena concerning subject-object asymmetries, *that*-trace effects, and parasitic gap constructions. This paper has illustrated that the VMH is problematic in both conceptual and empirical grounds. In particular we have illustrated that the VMH is incompatible with the PIC. This paper has proposed that a new analysis can account for all the examples suggested for the VMH.

The new analysis is based on the assumptions that an [EF] of an interrogative C can be satisfied by CP-Spec being filled by a wh-phrase or an empty operator, and that overt wh-phrases and empty operators are different in kind. Since a constituent of one kind does not block movement of a constituent of a different kind, the [EF] of C can be deleted by attracting an empty operator to CP-Spec instead of an interrogative subject, which remains in-situ. If there is only one candidate (for example, a wh-phrase) for filling the CP-Spec, the wh-phrase has to move to CP-Spec for the satisfaction of the [EF] requirements whether it is a subject or a non-subject. It is concluded that the new analysis is preferable to the VMH in many respects, even though there still remain some residual problems.

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15) We tentatively assume that the most embedded VP structure of (54b) is the following VP-shell structure like in double object constructions, where the object of the verb *intimidate* occupies a higher position than the object of the preposition *with*.

(i) [<sub>VP</sub> [<sub>V</sub> intimidate]  $Op_j$  [<sub>VP</sub> [<sub>V</sub> ~~intimidate~~] [<sub>PP</sub> with  $Op_i$ ]]]

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