

Wh-in-situ Phrases in English and the Phase Theory

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Wh-in-situ* Phrases in English and the Phase Theory

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1. Introduction

The recent minimalist program of generative grammar is making tremendous progress on the basis of the phase theory given by Chomsky (2008). Chomsky (2008) provides the interesting proposal that all operations are triggered by phase heads, and consequently syntactic operations are performed by phases simultaneously.

However, this system cannot deal with the Superiority effect in multiple *wh*-questions as in (1).

- (1) a. Who saw what?
- b. *What did who see?

Moreover, there also remains a problem how of the phase-based approach with Transfer operation can resolve long-distance phenomena as in (2). The example (2) is grammatical if who_2 takes matrix scope, though the structure of its embedded clause is the same as one of (1b).

- (2) Who_1 wonders what who_2 bought? (Lasnik and Saito (1992: 118))

The aim of this paper is to give a new proposal that could handle the Superiority Effects in terms of the system of Chomsky (2008), by presenting our new *wh*-in-situ phrase licensing system and another mechanism for syntactic derivation. Furthermore, we will show that our approach could also explain the long-distance phenomena such as (2) in the phrase system.

This paper is organized as follows. Section 2 presents the previous analysis to the Superiority effect. In section 3, we examine Chomsky's (2008) phase analysis and point out the problem with respect to the Superiority effect. In Section 4, we provide

our proposal and analysis. Concluding remarks are given in section 5.

2 . Previous Analyses

It has been argued that English multiple questions in (3) show the Superiority effect. Namely, the subject *wh*-phrase must move to Spec-CP as in (3a), unlike the object *wh*-phrase as in (3b).

(3) a. Who saw what? (= (1a))

b. *What did who see? (= (1b))

Given that the *wh*-phrase moves to Spec-CP after the subject in Spec-vP moves to Spec-TP as has been traditionally assumed, the structures of (3a,b) are shown as in (4a,b) respectively.

(4) a. who [C [(who) [T [(who) [v*-see [see what]]]]]]



b. *what [did [who [T [(what) [(who) [v*-see [see (what)]]]]]]]]



The Superiority effect has been accounted for in terms of Attract Closest (5) / Minimal Link Condition (6) in the framework of the minimalist program.

(5) Attract Closest (AC)

α can raise to target K only if there is no legitimate operation Move β targeting K, where β is closer to K. (Pesetsky (2000:15))

(6) Minimal Link Condition (MLC)

K attracts α only if there is no β , β closer to K than α , such that K attracts β .

(Chomsky (1995: 311))

(5)/(6) provide that the element which is closer to the target of movement must undergo movement if there are two potential elements for movement.

Let us consider the derivations of (4a,b) under (5)/(6). First, *who* is closer to C than *what* in (4a). Consequently, *who* moves to Spec-CP in accordance with (5)/(6), and this derivation results in grammaticality. On the other hand, in (3b), *what* undergoes movement to Spec-CP over *who*, even though the latter is closer to C than the former. This violates (5)/(6), so that it is ungrammatical.

However, this traditional explanation cannot be maintained under Chomsky's

(2008) system, because this system revises movement systems and gives a new proposal that both subject movement to Spec-TP and *wh*-movement to Spec-CP occur simultaneously, not step-by-step as has been traditionally assumed. This means (5)/(6) cannot function within this system. But then, there is also a fatal flaw in this system in that it cannot explain the derivation of the Superiority effect itself under the simultaneous operation system triggered by phase heads. In the next section, therefore, we will review Chomsky's (2008) analysis and then point out the problem with the Superiority effect.

3. Chomsky (2008)

Within the framework of minimalist program, Chomsky (2008) claims the simultaneousness of operations by phase heads(C, v*), assuming that they trigger all syntactic operations.

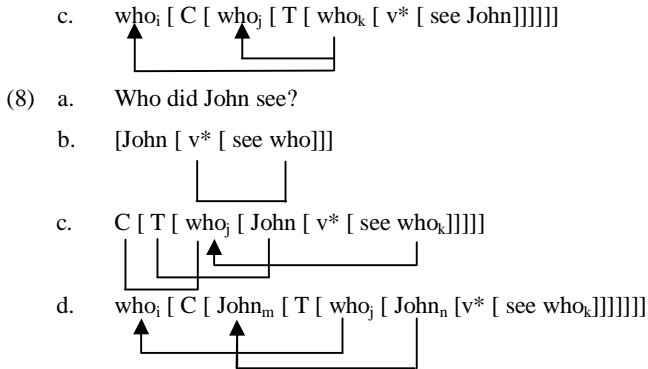
One of the crucial differences between this system and the traditional analysis is that the phase head of C has both an edge feature (EF), which attracts a *wh*-phrase to the edge of C, and an Agree feature (AF), which attracts a subject to Spec-TP. Namely, it is assumed that T lacks any features such as a \bar{A} -feature and a tense feature in the lexicon, so that these features are inherited from C only if T is selected by C. Under this assumption, it follows that the movement of the subject in Spec-vP is performed by T triggered by C (C-T), not T itself as it has been assumed. Moreover, it has been proposed that C moves the *wh*-phrase to Spec-CP on its own, and consequently both *wh*-movement by C and subject movement by T occur simultaneously.

Under this system, the derivation of the subject *wh*-question in English (7a) will be shown as in (7b-c).¹ First, in (7b), C-T and C access *who* simultaneously, so that the movement to Spec-TP (*who*_i) and the one to Spec-CP (*who*_i) occur simultaneously as in (7c). Finally, the head of the chain is pronounced, and then it results in grammaticality.

(7) a. Who saw John?

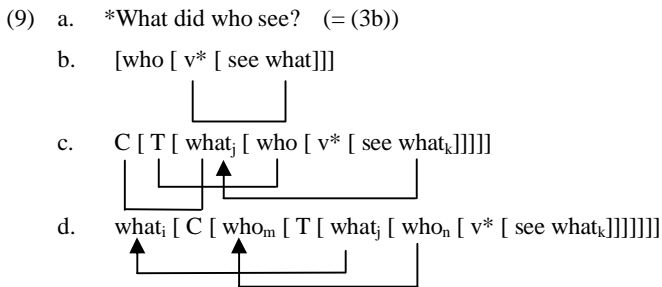
b. C [T [who [v* [see John]]]]





As for the object *wh*-question of (8a), v^* accesses *who* at the stage of (8b), and then *who* moves to Spec- v^*P as in (8c). Next, at the stage of (8d), C-T agrees with *John* and C accesses who_j . Then, both movement to Spec-TP ($John_m$) and *wh*-movement to Spec-CP (who_i) occur simultaneously. Consequently, the head of the chain is pronounced, and then it is grammatical. Thus, this system can give a unified explanation to *wh*-movement.

However, this analysis cannot deal with the Superiority effect of (3a,b). Under this idea, the derivation of (3b) (repeated as in (9a)) will be shown as in (9b-d).



At the stage of (9b), v^* accesses *what*. Next, at the stage of (9c), C-T agrees with *who* and C accesses $what_j$. Hence, *who* moves to Spec-TP (who_m) and *what* moves to Spec-CP ($what_i$) simultaneously, as in (9d). Importantly, these two movements occur simultaneously, so that it follows that who_m is not an intervener for $what_j$, because who_m does not exist in Spec-TP when C accesses $what_j$. As a result, this system would wrongly predict this example to be grammatical. Consequently, this theory cannot deal with the Superiority effect, as pointed out by Chomsky

(2008:152) himself. Then, in the next section, we will give a resolution to this problem, by proposing a new mechanism for *wh*-in-situ phrase licensing and another mechanism for the derivational system of syntactic derivation.

4. Proposal

4.1 Interpretative Conditions for *wh*-questions

In this section, we will give our proposal for resolving this problem with the Superiority effect based on the minimalist program advanced by Chomsky (2000, 2001, 2004, 2008). First, we will assume that the syntactic structure is built up derivationally in terms of each phase, and the relevant structure is transferred to the semantic component and the phonological component step by step at the phase levels. Furthermore, following Chomsky (2008), we will also assume that all syntactic operations are driven by phase heads. Moreover, we assume that information transferred cyclically is accumulated, being updated, and semantic information must be consistent to build a well-formed semantic representation. Thus, we adopt a general condition on semantic information in (10), which is proposed by Nishimura (2007).

(10) Ban on Contradictory Information (BCI)

Semantic information may not include any contradiction.

(Nishimura (2007: 422))

In this paper, we consider that (10) is one of the interface conditions. Following Nishimura (2007), we suppose that a syntactically encoded licensing relation between two elements provides the basis of semantic information in some cases, and therefore, the relation must be consistent to satisfy (10). If a derivation contains reversal of the licensing relation between the same two elements in such cases, it will violate BCI. Then, we also assume that a make-up strategy in (11a) functions in this case to satisfy (10) based on Nishimura (2007).

(11) Make-up Strategy

a. Cancellation of the licensing relation

The licensing relation is canceled if the relation reverses between the same two elements. (ibid.: 423)

b. TAKE-OVER

A phase head takes over the interpretable feature [F] of a syntactically unlicensed element, when it transfers its domain which contains such an element.

Furthermore, in this paper, we will propose the TAKE-OVER operation as another make-up strategy as in (11b). Chomsky (2008) assumes that phase heads trigger all of syntactic operations including the TRANSFER operation. Then, we will propose that phase heads should perform the TAKE-OVER operation of (11b). Given that the licensing relation between two elements, which have some semantic sharing, is taken to be the c-command relation, if a licensee is transferred without being syntactically licensed in terms of a c-command relation, we propose that (11b) functions. As a result, the phase head takes over the interpretable feature of the unlicensed element when the head transfers the domain including such an element, and we claim that syntactic information of the unlicensed element can be kept in the syntactic derivation. Then, when a new licenser occurs in the higher phase level, it c-commands the phase head which takes over the interpretable feature of the unlicensed element already transferred. Consequently, the unlicensed element can be licensed appropriately by the new licenser in the interface.

Moreover, as for c-command which functions in the system of Chomsky (2008), we will adopt the definition of derivational c-command (C_d -command) of (12) provided by Epstein et al. (1998).

(12) Derivational C-command (C_d -command)

X c-commands all and only the terms of the category Y with which X was paired/concatenated by Merge or Move in the course of derivation.

(Epstein et al. (1998: 10))

(12) regulates that X comes in to a c-command relation with Y (and its terms) when X is merged with Y .

Finally, we will propose two licensing conditions on *wh*-phrases in English *wh*-questions as in (13). We will claim that the satisfaction of (13a) / (13b) brings the appropriate interpretation of *wh*-phrases as *wh*-questions at Conceptual-Intentional (C-I) interface.

(13) Licensing Conditions on English *wh*-questions

- a. A *wh*-phrase is licensed by moving to Spec-CP.
- b. A *wh*-phrase is licensed by being c_i -commanded by another *wh*-phrase sharing the interpretable *wh*-feature [WH].

We assume (13a) based on Chomsky (2008), which consequently leads to the appropriate interpretation as an appropriate *wh*-question. On the other hand, supposing that a *wh*-phrase has an interpretable *wh*-feature [WH], we will also give a new proposal of (13b) that a *wh*-phrase must be c -commanded by another *wh*-phrase in the same sentence. As a result, the *wh*-phrase comes into the scope of the *wh*-phrase of its licenser, and then it can receive the appropriate interpretation as a multiple *wh*-question at the C-I interface. Namely, we could say that that the *wh*-phrase results in the *wh*-in-situ phrase in English when it is licensed in terms of (13b).

4.2 An Analysis

Now, let us consider the examples of multiple *wh*-questions under our assumptions. First, the derivation of (14a) which shows the Superiority effect violation can be accommodated as follows.²

- (14) a. *What did who see? (=3b))
- b. who [v*-see [see what]] (who > what)
- c. what_j [who [v*-see [see what_k]]] (what > who)
- d. what_j [who [v*-see [see what_k]]]
- e. C [T [what_j [who [v*-see [see what_k]]]]]
- f. what_i [C [who_m [T [what_j [who_n [v*-see [see what_k]]]]]]]]]

At the stage of (14b), *who* c_i -commands *what*, but the c -command relation reverses when *what* moves to outer Spec- v^*P , as in (14c). Then, the licensing relation is canceled in terms of the make-up strategy of (11a) to satisfy BCI (10). When T and

C merge respectively at the stage of (14e), C-T agrees with *who*, and C accesses *what_i*. As a result, *who_n* moves to Spec-TP (*who_m*), and *what_i* moves to Spec-CP (*what_i*) simultaneously, as illustrated in (14f). Here, notice that the c-command relation is built under the definition of *c_d*-command (12) when two elements undergoes Merge operation. Thus, the c-command relation between *what_i* and *who_m* is not established at the stage of (14f), because each of these two elements undergo Merge operation simultaneously. Consequently, *what_i* satisfies (13a), while *who_m* is transferred without satisfying (13a)/ (13b), and then it is still unlicensed. Thus, it results in an ungrammatical sentence.

On the other hand, as for the grammaticality of (15a), *who* *c_d*-commands *what* at the stage of (15b), and the c-command relation between them remains the same as in the derivation of (15b-e). Then, *what* can be licensed in terms of (13b). Also, *who* can be licensed in terms of (13a). As a result, the sentence can be licensed/ interpreted at the C-I interface, and this results in its being grammatical.

- (15) a. Who saw what? (=3a)
- b. who [v*-see [see what]] (who > what)
- c. who [v*-see [see what]]
- d. C [T [who [v*-see [see what]]]]
- ┌──┐
- e. who_i [C [who_j [T [who_k [v*-see [see what]]]]]]
- ↑ ↑

Thus the contrast in the Superiority effect between (14a) and (15a) finds a natural explanation in our analysis.

Next, let us examine an interesting example in which the Superiority effect disappears when *wh*-in-situ phrases are embedded within the subject phrase as in (16). The derivation of (16) is illustrated in (17a-e).

- (16) Who do [books about what] annoy most? (Stroik (1996: 90))
- (17) a. [books about what] [v*-annoy [annoy who most]]
- ┌──────────┐
- b. who_i [[books about what] [v*-annoy [annoy who_k most]]] (who > what)
- ↑

- c. who_j [[books about what] [v*-see [see who_k most]]]
- d. C [T [who_j [[books about what] [v*-see [see who_k most]]]]]
- e. who_i [C [[books about what]_m [T [who_j [[books about what]_n [v*-see
 [see who_k most]]]]]]]
-

(16) is grammatical, even though the object *wh*-phrase (*who*) moves over the subject phrase (*books about what*). This can be explained under our analysis as follows. At the stage of (17a), *what* does not c_d -command *who*, because *what* is embedded within the subject phrase. Then, when *who* moves to Spec-v*P at the stage of (17b), *who* c_d -commands *what* and *what* can be licensed in terms of (13b).

In addition, *who* can be licensed in terms of (13a), because it moves to Spec-CP as illustrated in (17e). Thus, both *wh*-phrases can be licensed/interpreted at the C-I interface, and then it can be grammatical.

Moreover, our analysis can deal with the long-distance phenomena with respect to the Superiority effect as in (18).

- (18) Who_1 wonders what who_2 bought? (= (2)) (Lasnik and Saito (1992: 118))

Notice that (18) is grammatical only when the lower *who*₂ takes the matrix scope, even though the derivation of the embedded clause is the same as the one of (14a). Moreover, there is also another problem for this example from the point of view of the current minimalist approach, because this theory assumes the TRANSFER operation applied at each phase, so that this long-distance licensing phenomena cannot be straightforwardly handled under this theory.

In this paper, we will give a new solution to this example in terms of the TAKE-OVER operation of (11b). The derivation of the embedded clause of (18) is the same as (14a), and then it follows the same derivation up to (14f). When (14f) is formed, the embedded TP is transferred as in (19a). However, *who*_m is transferred without being c_d -commanded at this stage, so that we claim that TAKE-OVER of (11b) functions at this stage. Namely, it can be assumed that the phase head of C takes over the interpretable feature [WH] of *who*_m.

c-command relation, as well as *wh*-in-situ licensing under our approach. Then, we argue that the mechanism of NPI licensing is parallel to the one of *wh*-in-situ phrase licensing.

Up to this point, we have demonstrated that the syntactic relation of *wh*-in-situ phrases can be dealt with in terms of the c-command relation between the licenser (*wh*-phrase) and the licensee (*wh*-in-situ phrase). Here, we will argue that the NPI licensing also requires the syntactic relation in terms of the c-command. Here, we assume that NPIs carry the interpretable feature [NPI], and NPIs must be c-commanded by negative elements or interrogative elements with interpretable features of affective features [AFFECTIVE] such as negative features [NEG] or interrogative features [Q]. In addition, in case of NPI licensing, we also assume that the syntactic licensing relation must satisfy BCI (21) to receive the appropriate interpretation at the C-I interface.

(21) Ban on Contradictory Information (BCI) (= (10))

Semantic information may not include any contradiction.

(Nishimura (2007: 422))

Therefore, once the c-command relation between two elements reverses, we assume that the relation is cancelled, because the make-up strategy of (22a) functions in order to satisfy BCI (21). Moreover, when an NPI is transferred without being c-commanded syntactically, we propose that (22b) functions, and then the phase head which transfers the domain including the unlicensed NPI takes over [NPI] of NPI.

(22) Make-up Strategy (= (11))

a. Cancellation of the licensing relation:

The licensing relation is canceled if the relation reverses between the same two elements. (ibid.: 423)

b. TAKE-OVER:

A phase head takes over the interpretable feature [F] of a syntactically unlicensed element, when it transfers its domain which contains such an element.

Finally, adopting the definition of c_d -command, we will give a licensing condition

on NPIs under our analysis, as in (23).

(23) Licensing Condition on NPIs

An NPI is licensed by being c_d -commanded by an element with interpretative features [AFFECTIVE] such as a negative element/an interrogative element.

Under these assumptions, the contrast of the grammaticality in (20) can be accommodated as follows. The derivations of (20a,b) are roughly shown as in (24a,b), respectively.

- (24) a. $[_{TP} \text{John didn't } [_{v^*P} (\text{John eat anything})]]$ (not > anything)
b. $*[_{TP} \text{Anyone didn't } [_{v^*P} (\text{anyone eat an apple})]]$

In (24a), *not* c_d -commands *anything*, and *anything* can satisfy (23) without the reversal of the *c*-command relation between them in the course of derivation. Consequently, it can be licensed appropriately, and then the example is grammatical. On the other hand, in (24b), the *c*-command relation between them reverses when *anyone* moves to Spec-TP over *not*, and then (22a) functions in order to satisfy (21), so that the relation is cancelled. As a result, *anyone* cannot satisfy (23) and it remains unlicensed, and this results in its ungrammaticality.

NPIs can occur in the subject position in (25) when it is embedded within the subject phrase, which is similar to the example of *wh*-in-situ phrase (16).

- (25) A doctor [who knew anything][about acupuncture] was not available.

(Linebarger (1980:149))

- (26) $[_{TP} [_{NP} \text{a doctor } [_{CP} \text{who knew anything about acupuncture}]]]$ was not
 $[_{VP} ([_{NP} \text{a doctor } [\text{who knew anything about acupuncture}])]$ (was) available]]

(not > anything)

Thus, this example can be accounted for by the same explanation as (16). In (26), when *not* merges with *vP*, it c_d -commands *anything*. Then, the *c*-command relation remains the same, because *anything* is embedded within the subject phrase. Consequently, (23) is satisfied appropriately, so that *anything* can be licensed by *not*, and this results in its grammaticality.

Furthermore, our analysis can also handle the example of (27) as follows.

- (27) I don't think that anyone didn't attend the party. (Nishioka (2007: 120))

- (28) $[_{TP} \text{I don't}_1 [_{v^*P} \text{think} [_{CP} \text{that} [_{TP} \text{anyone didn't}_2 [_{v^*P} (\text{anyone}) \text{attend the party}]]]]]]$
 $[_{NPI}] \leftarrow -[_{NPI}]$ (not₁ > C_[NPI])
 TAKE-OVER

The derivation of (27) can be shown as in (28). In (28), when *not*₂ merges with v*P in the embedded clause, it c_d-commands *anyone*. However, once *anyone* moves to Spec-TP over *not*₂, the c-command relation reverses, so that the relation is cancelled in terms of (22a). Moreover, when C in the embedded clause transfers the TP-domain, the domain includes *anyone* which is unlicensed syntactically with respect to the c-command. Then, C takes over [NPI] of *anyone* in terms of (21b), and then, *not*₁ in the matrix clause can c_d-command C with [NPI]. Consequently, *anyone* can be appropriately licensed by *not*₁ in the matrix clause at the C-I interface.

To sum up this section, we have shown that our approach can deal with NPI licensing as well as the Superiority effect. Consequently, our approach can achieve a theoretical unification for such licensing phenomena.

5. Concluding Remarks

In this paper, we have wrestled with problems which cannot be solved under the phase theory, as described by Chomsky (2008). First, we have argued that the Superiority effect can be dealt with even under Chomsky's (2008) system, by adopting the definition of c_d-command given by Epstein et al. (1998) and the general condition (29) with the make-up strategy (30a) provided by Nishimura (2007), and proposing our new mechanism of (30b). Especially, we have shown that our analysis with (30b) can explain the long-distance phenomena with respect to the Superiority effect in the phase theory which assumes the TRANSFER operation at each phase.

- (29) Ban on Contradictory Information (BCI) (= (21))

Semantic information may not include any contradiction.

(Nishimura (2007: 422))

(30) Make-up Strategy (= (22))

- a. Cancellation of the licensing relation:

The licensing relation is canceled if the relation reverses between the same two elements. (ibid.: 423)

- b. TAKE-OVER:

A phase head takes over the interpretable feature [F] of a syntactically unlicensed element, when it transfers its domain which contains such an element.

Furthermore, we have shown the licensing condition on *wh*-phrases in English, as in (31).

(31) Licensing Condition on English *wh*-questions (= (13))

- a. A *wh*-phrase is licensed by moving to Spec-CP.
b. A *wh*-phrase is licensed by being c_a-commanded by another *wh*-phrase sharing the interpretable *wh*-feature [WH].

Under our approach, when a *wh*-phrase is licensed in terms of (31b), it follows that it is a *wh*-in-situ phrase in English. Moreover, this idea can extend to NPI licensing mechanism, so that we have argued that our approach can achieve theoretical unification for these two licensing phenomena.

The theoretical significance of the proposal consists in the showing that the phase theory given by Chomsky (2008) can be successfully supported, and *wh*-in-situ phrase licensing in English can be dealt with in terms of a general principle of a licensing relation between a licenser and a licensee as well as NPI licensing.

Notes

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1. Chomsky (2008) assumes the object movement to Spec-VP in terms of V triggered by v*, as well as the subject movement to Spec-TP in terms of C-T, but we omit this point in this paper.
2. In this paper, the use of outlined letters represents the transfer domain. In addition, the symbol ">" expresses the c-command relation

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