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# The Refinement of Syntactic Derivations with the Domain-extended Transfer<sup>†</sup>

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## 1. Introduction

Various analyses have been proposed in the literature for the issue of how a syntactic derivation proceeds. For example, under the so-called Principle and Parameter approach since Chomsky (1981), words combine to form a sentence at the D-Structure, and it is mapped to the S-Structure through various operations such as movement, further being mapped to the two interfaces, namely Logical Form and Phonetic (or Phonological) Form. Under this approach, each linguistic level a derivation is cycled one time and thus there are as many cycles as the number of linguistic levels.

However, in Chomsky (1995), through the abandonment of both the D-Structure and the S-Structure, the way a derivation proceeds changed: a derivation is divided into some chunks and proceeds chunk by chunk, mainly for the reason of the reduction of computational burden. Chomsky (2000, 2001) call this chunk “phase.” To be more precise, Chomsky assumes that *vP* and *CP* are phases, and that a derivation proceeds phase by phase. For example, in a simple sentence like *John saw Mary*, a *vP* containing *John*, *saw* and *Mary* is formed, being mapped to interfaces, and after that, a derivation goes further to form a *CP*, being again mapped to interfaces. These mappings are often called “Transfer.”

This paper aims to explore the precise mechanism of this operation “Transfer.” Specifically, the precise mechanism of Transfer will be examined based on Chomsky (2000) to propose a new analysis to account for the problem that previous studies cannot.

This paper is organized as follows. In section 2, we will first outline a theory of Transfer, especially the one in Chomsky (2000). Based on the overview, section 3 will discuss the potential problem the traditional system of Transfer poses. We will propose a new approach in section 4. In section 5, we will examine through the revision of the notion of phasehood whether the proposed analysis is compatible with the traditional idea concerning external arguments. Section 6 will conclude the paper.

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## 2. What Is Transfer and What Is Transferred?

In this section, we briefly take a general look at the theory for Transfer, especially Chomsky (2000), to discuss both the theoretical and empirical problems in later sections. As shortly noted in the introduction, syntactic objects are formed in syntactic component and Transfer hands them to interfaces. Chomsky (2000) assume that it applies at each phase level. At this point, one question naturally arises: which portion of syntactic objects is transferred? Ideally speaking, the assumption that the entire syntactic objects are mapped to interfaces at each phase level is simple and thus preferable. If the entire syntactic objects are mapped, it means that a derivation makes best use of the computational efficiency because it is more efficient than the assumption under which some portions are left in syntax.

However, this assumption turns out not to work well if we take into consideration successive-cyclic movement such as *wh*-movement. Consider (1).

- (1) a. What did you eat?  
b. \*Did you eat what?

As (1) indicates, except for echo questions, *wh*-phrases in English interrogative sentences must occupy the sentence initial position. This means that they should be available for *wh*-movement at each cycle until they get there. However, this is the point where a problem comes about given the assumption that the entire syntactic objects are transferred. Consider (2).

- (2) [<sub>VP</sub> what<sub>i</sub> you v [<sub>VP</sub> eat t<sub>i</sub>]]<sup>1</sup>

If the assumption is correct, the entire syntactic object, in the case in question the phase *vP* containing *what*, is transferred and then it is trapped inside the *vP*, being unable to move outside the *vP*. Therefore, it cannot reach the sentence initial position and the assumption that the entire syntactic objects are transferred incorrectly predicts that grammatical sentences like (1a) would never be derived.

In this line of reasoning, Chomsky (2000) defines Transfer as in (3).

- (3) *Transfer A*

Transfer applies to the complement of a phase head and maps it to interfaces.

Since, under the definition in (3), only the complement domain is transferred, elements in the edge position, a phase head and its specifier, are never mapped at each phase level and are still available for further syntactic computation after Transfer. Returning to *wh*-phrases, given that they undergo successive-cyclic movement through the specifier position of a phase head, they can successfully

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<sup>1</sup>Here we assume following Koopman and Sportiche (1991) that the so-called Predicate-Internal Subject Hypothesis, according to which subjects originate within VPs, and, throughout this paper, that subjects are base-generated in the position of *vP*.

reach the sentence initial position thanks to (3). Thus the domain transferred is not an entire phase, but the complement of a phase head, as Chomsky concludes.

In a nutshell, in this section we have outlined the theory of Transfer and it has been concluded that Transfer applies to the complement of a phase head, leaving edge positions unaffected. It will be argued in the next section, however, that the definition in (3) causes a serious theoretical problem.

### 3. Potential Problem on Transfer

Although the Transfer A in (3) has been assumed by many researchers explicitly or implicitly, this section points out a serious theoretical problem posed by (3) and also the necessity to call for an alternative approach.

As pointed out by Obata (2010) and Goto (2011), there is a theoretical problem in the definition in (3). Consider a simple question in (4a) and its structural representation in (4b).

- (4) a. What did you eat?  
b. [CP what<sub>i</sub> did [TP you T [<sub>vP</sub> v [VP eat t<sub>i</sub>]]]]

If the definition of Transfer in (3) is correct and phases are CP and  $vP$ , as Chomsky assumes, it should be expected that Transfer applies first to the complement of  $v$ , namely VP, and then to the complement of C, namely TP. However, at this point, a natural, and crucial, question arises: how are the elements in the positions of the matrix C and its specifier transferred? Since the domain transferred is defined as the complement of a phase head, it is predicted that these elements are never transferred. This is a nontrivial conceptual problem because they typically have information which should be interpreted at interfaces: they have a semantic interpretation at the LF side, and they have phonetic content at the PF side. Thus, despite the fact that they should be transferred to be interpreted appropriately at interfaces, they are expected not to be under the definition in (3).

One might argue, as assumed by some researchers, that after TP is transferred, Transfer applies to the rest one more time. This, however, is just a stipulation because it is not drawn straightforwardly from the definition: since CP is not a complement of any phase head at all, Transfer is expected not to take place again after transferring TP.

Summarizing the gist of this section, it has been argued that some elements are left in syntax after Transfer and there is *no* chance of transferring them under the definition in (3). For this reason, we need an alternative definition of Transfer to solve this theoretical problem, which is the topic of the next section.



#### 4. An Alternative Approach

Before turning to our proposal, it is worth noting that some previous studies propose alternative analyses to solve the problem raised above. Obata (2010) and Goto (2008, 2011) suggest that at the matrix CP level, Transfer applies not to the complement of C, but to the entire CP instead. This suggestion is supported by the empirical evidence that the elements in the domain of matrix CP and TP behave differently from those in the domain of embedded CP and TP. With this observation, they claim that the Feature Inheritance is obligatory at the embedded CP-TP level, while it is not at the matrix CP-TP level.

(5) *Feature Inheritance*

Uninterpretable/unvalued features that phase heads originally host are inherited to the heads immediately below.

Obata and Goto further advance their discussion, based on the two premises by Richards (2007): Value and Transfer of uF must happen together, and the edge and nonedge (complement) of a phase are transferred separately, and conclude that if the Feature Inheritance is not operative at the matrix CP-TP level, there is no need to transfer the matrix CP and TP separately. In other words, the domain transferred at the matrix CP level is the entire CP, not the complement TP. Then, thanks to this assumption, the problem raised in section 3 does not arise since the elements in the positions of C and its specifiers are successfully transferred, hence an empirically desirable approach.

Nevertheless, despite the elegance of their explanation, they still face another problem. The point is that their explanations rest on the absence of the Feature Inheritance at the matrix CP-TP level. If the Feature Inheritance does not take place at this level, it is predicted that C retains an EPP feature (or an edge feature) as well as a  $\phi$ -feature. Then this incorrectly rules in ungrammatical sentences such as (6a).

- (6) a. \* What do often you eat for lunch?  
b. [CP what<sub>i</sub> C<sub>{ $\phi$ ,Q,EPP</sub>}(do) [TP T<sub>[ ]</sub> [VP often [VP you [VP eat  $t_i$ ]] for lunch]]]  
c. What do you often eat for lunch?

As the structural representation in (6b) indicates, C retains an EPP feature without transmitting it to T, and this EPP feature is checked by moving *what* to Spec CP. This means that there is no need for the subject *you* to undergo movement to Spec TP that is usually assumed, and hence the sentence in (6c) is expected to be grammatical, and a grammatical sentence such as (6c) is never derived under the analysis by Obata and Goto, contrary to the fact. Thus, this empirical problem is inevitable as long as we keep their feature-inheritance-based assumption that the domain transferred is extended only at the matrix CP level.

Now let us pay attention to our seeking an alternative approach. The problem has been that there still remain some elements that are *never* transferred because of the definition in (3). The solution to

this problem is very simple. In this paper, I propose that the domain transferred is not the complement of a phase head, but the entire phase, as revised below:

(7) *Transfer B*

Transfer applies to the entire phase and maps it to interfaces.

Under this definition, the problem that some elements are left after Transfer does not arise: the elements in the positions of C and its specifier are transferred in Transfer at the CP phase level and hence no element remains untransferred.

However, recall that Chomsky assumes, as discussed in section 2, that the domain transferred is not the entire phase when we are concerned with successive-cyclic movement such as *wh*-movement. If the definition in (7) is correct, such movement is predicted to be impossible because of the PIC. To be more precise, if the entire phase is transferred, they cannot undergo further movement since Transfer includes the elements occupying the specifier position of a phase, and it is predicted that *wh*-questions in English are never derived.

To solve the problem at issue, I assume following Bošković (2007) that uninterpretable/unvalued features are driving force of movement. Consider the situation in which a derivation reached the point where  $\nu$ P of (4) is formed, as represented in (8).

(8) [ $\nu$ P you  $\nu$  [ $\nu$ P eat what<sub>[iwh,uQ]</sub>]]

Bošković (2007) discusses the abandonment of the presence of the so-called EPP feature and assumes that the intermediate *wh*-movement is driven not by an EPP feature but by an uninterpretable feature that *wh*-phrases themselves have. In the case of (8), *what* has an uninterpretable Q feature, which forces it to undergo *wh*-movement. Here I propose in addition that if an element undergoes movement which is motivated by an uninterpretable/unvalued feature, it can adjoin to a phase itself; in the case in question, *what* adjoins to  $\nu$ P, forming the structure below:

(9) [ $\nu$ P what<sub>[iwh,uQ]</sub><sub>i</sub> [ $\nu$ P you  $\nu$  [ $\nu$ P eat  $t_i$ ]]]

Here, *what* is not properly contained in  $\nu$ P. The definition of *proper containment* is given below:

(10) *Proper Containment*

$\alpha$  properly contains  $\beta$  if  $\beta$  stands in an inclusion relation with all the segments of  $\alpha$ .

In (9), since *what* occupies the adjoined position, it is not in an inclusion relation with the lower  $\nu$ P. According to (10), therefore, *what* is not properly contained in the  $\nu$ P. Moreover, assuming that a phase consists of elements which are properly contained in the phase, the domain transferred in (9) is the lower  $\nu$ P and hence *what* in the adjoined position is not transferred at the  $\nu$ P phase level. Formally speaking, following the idea of Chomsky (2004, 2013) that adjunction is not a set-forming operation, but a pair-forming operation, (9) can be represented as follows:

$$(11) \quad \nu P = \langle \text{what}, \{\text{you}, \{\nu, \{\text{eat}, t_1\}\}\} \rangle$$

Given this representation, now we can revise and newly formalize the mechanism of Transfer as in (12).

$$(12) \quad \textit{Transfer C}$$

Applied to syntactic objects, Transfer maps the members of the maximal set to interfaces.

According to (12), {you} and { $\nu$ , {eat,  $t_1$ }} are sent to interfaces, individually. This corresponds to the Transfer of the entire phase, leaving *what* in the adjoined position unaffected. Therefore we can keep the idea of transferring the entire phase at each phase level while making full use of successive-cyclic movement such as *wh*-movement.

A note is in order here. One might argue that if the entire phase is transferred at each phase level, it is expected that external arguments are also trapped inside phases; typically they are assumed to move to Spec TP in English. This concern, however, can be avoided by assuming that it is after Transfer at the  $\nu P$  phase level that external arguments are introduced into a derivation. This point will be discussed in detail in the next section. Therefore, there arises no theoretical problem for external arguments as well as *wh*-phrases with respect to Transfer C in (12).

To sum up, to solve the problem raised in section 3, we have examined the previous studies such as Obata (2010) and Goto (2008, 2011). Although they give us an apparent satisfactory explanation, it has been shown that they still pose an empirical problem concerning linearization. Then it has been proposed that the domain transferred is not the complement of a phase head but the entire phase or, more precisely, the members of a phase as a set. As for the potential problem arising from the current approach, it has also been suggested following Bošković (2007) that *wh*-phrases have uninterpretable features and, due to them, can move to the adjoined position of a phase, surviving from Transfer at each phase level.

## 5. Escape from Transfer

The previous section has raised a question of how external arguments move to Spec TP under our current proposal which states that the domain transferred is the entire phase. In this section, after reconsidering the notion of phasehood, I propose a Transfer system which does not raise the question.

In English, external arguments are widely assumed to originate within predicates and then move to Spec TP. The position where they are base-generated are typically Spec  $\nu P$ . However, this cannot be adopted as it is under our analysis. In the previous section, we have proposed that the entire phase is transferred, formalized as Transfer C in (12). This amounts to saying that external arguments are transferred at the  $\nu P$  phase level, never raising to Spec TP. Since the movement of external arguments

to Spec TP is well-motivated (cf. Chomsky 1981), in order to make full use of Transfer C, we need an alternative theory as to them.

Concerning this point, we assume following Kratzer (1996) that external arguments are introduced not by  $v$ , but by Voice. Her argument is based on the observation by Marantz (1984) that external arguments are not true arguments of verbs. Consider (13).

- (13) a. throw a baseball  
b. throw support behind a candidate  
c. throw a boxing match (i.e., take a dive)  
d. throw a party  
e. throw a fit (Kratzer 1996:113)

The interpretation of the verb *throw* depends on its internal argument. For example, the interpretation of *throw* in (13a) is a kind of physical throwing action, but the one in (13b) is an action such as stating something beneficial for the candidate. This means that the interpretation of verbs varies according to its internal argument they combine with. On the other hand, there are few cases that external arguments do the same. This led Marantz and Kratzer to conclude that external arguments are not true arguments of verbs. Furthermore, Kratzer implemented this idea syntactically by assuming that there is VoiceP above VP. Armed with this assumption, now we have the following structure:

- (14) [<sub>VoiceP</sub> EA Voice [<sub>vP</sub> v [<sub>VP</sub> V IA ]]]

Here, the problem that external arguments are transferred at the  $vP$  phase level is resolved simply because they are not included in the domain transferred, namely the  $vP$  in (14). Thus, after Transfer, they are still available for further syntactic operation and can raise to Spec TP.

Before ending this section, let us discuss phasehood for the purpose of answering the question that naturally arises: why is  $vP$  is the domain transferred or why is VoiceP not transferred?

So far, we have assumed that phases are CPs and  $vPs$ . However, why? Chomsky (2001) claims that phasehood is related to propositionality. However, as Narita (2011) objects, a problem lies in this definition of phasehood: propositionality cannot be defined by itself. For example, Chomsky assumes that transitive and unergative  $vPs$  are phases since they introduce external arguments whereas unaccusative and passive  $vPs$  are not since they do not introduce external arguments. Narita casts doubt on this definition as the following quotation indicates (Narita 2011:51):

*Prima facie*, passive and unaccusative structures seem to be as 'propositional' as transitive ones, especially given that all the relevant  $\theta$ -roles are discharged within these  $vPs$ , too, and thus it remains unclear under [the characterization "phases are propositional"] why unaccusative and passive  $vPs$ , as opposed to transitive  $v$  ( $v^*$ , to adopt Chomsky notation), cannot constitute their own phases. For example, the unaccusative  $vP$  in *the plane*<sub>i</sub> [<sub>vP</sub>

*arrived  $t_i$*  is presumably as complete as possible, propositionally and  $\theta$ -theoretically. They don't assume external arguments, but it is not at all clear in most cases how they can be seen 'defective' by any means.

Thus it may not be fully adequate to define phasehood under propositionality.

Bearing this in mind, we assume that phasehood is defined by the interaction between uninterpretable/unvalued features and Transfer. As Chomsky argues, unvalued features must get valued by Agree with valued counterparts in the course of derivation; otherwise a derivation crashes at interfaces. However, once they get valued, they become indistinguishable from valued features, and Transfer cannot decide which features should be sent to the interface, say LF, or should not. To avoid this situation, we agree with Narita (2011) that Transfer applies as soon as unvalued features get valued.<sup>2</sup> To be more precise, I assume the idea that memory is phase-level (Chomsky 2014:8), which means that at each phase level, a derivational history is available, thereby Transfer can decide which features are to be sent to interfaces. Moreover, this concept provides us with a nice result. Given that uninterpretable/unvalued features are located on certain heads as noted above, as soon as they are introduced into a derivation, Agree applies and then Transfer also applies. Of importance here is that phasehood is not given *a priori*. Specifically, uninterpretable/unvalued features cause Agree and Transfer to apply and they are transferred, and we happen to call the unit "phase." Thus it is not that phase heads are given first, on which uninterpretable/unvalued features are located, but it is through the interaction between uninterpretable/unvalued features and Transfer that phasehood is determined. In other words, there is no need to have recourse to the notion of phase to analyze a syntactic derivation.

With this conclusion, now we can answer the question concerning  $vP$ 's phasehood. Recall that  $v$  originally has uninterpretable/unvalued features such as  $\phi$ -features, and when merged, it transmit such features to the head immediately below by the Feature Inheritance. Since these features must get valued in the course of derivation, Agree must take place after the Feature Inheritance. Then it follows that after Agree, Transfer must apply for the reason noted above. This corresponds to defining  $vP$  as the domain transferred. On the other hand, Transfer does not apply when VoiceP is formed because we can assume that Voice has no uninterpretable/unvalued feature. After VoiceP is formed, a derivation proceeds to form CP, and at this level, VoiceP is transferred as a part of CP. Thus the domain transferred is  $vP$  and VoiceP is not such a domain.

Summarizing this section, we have confirmed whether the approach proposed in the section 4 fall in place with a traditional idea concerning external arguments and have concluded that this

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<sup>2</sup>Strictly speaking, the mechanism I assume here is not the same as the one in Narita (2011). He assumes that Internal Merge, Agree, and Transfer happen simultaneously to avoid the situation, but this is theoretically impossible: since its simultaneity means that when Transfer applies, Agree has not applied, then, under his theory, it is incorrectly expected that Transfer sends unvalued features to interfaces or that Transfer cannot apply because of the presence of unvalued features. For this reason, in this paper, I do not adopt the same theoretical architecture as Narita (2011).

can be achieved by assuming the two points: (i) external arguments are introduced by Voice and (ii) phasehood is determined by the interaction between uninterpretable/unvalued features and Transfer. Armed with these assumptions, it can be concluded that our current approach has solid theoretical ground.

## 6. Concluding Remarks

In this paper, it has been argued how a syntactic derivation proceeds under the recent framework of the Minimalist Program. First we have witnessed that there is a serious problem under the traditional system of Transfer, under which the domain transferred is the complement of a phase head: i.e. some elements, especially ones in the positions of C and its specifier, remain untransferred. To avoid this problem, We have proposed a new system of Transfer which states that the domain of Transfer is the entire phase. Although the new system come with a nontrivial problem concerning *wh*-movement, it can be circumvented by assuming that adjunction is a pair-forming operations, not a set-forming operation, and also that the mechanism of Transfer is formalized as in (12). Moreover we have examined whether our current approach shows compatibility with the idea that external arguments raise to Spec TP, and indeed we have reached a positive conclusion. This conclusion comes with some additional assumption: external arguments are introduced by Voice and phasehood is determined by the interaction between uninterpretable/unvalued features and Transfer.

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