THE ROLE OF THE CYCLE IN A DERIVATIONAL APPROACH

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Keywords: minimalism, chain, the EPP, successive cyclicity, phase

1. Introduction

The shift from the GB framework to the minimalist program suggests that the computational system of human language \(C_{HL}\) should be positively characterized in the sense that it only generates well-formed syntactic output. A natural question is why it should be so. To answer this question, any linguistic theory has to uncover computational processes underlying observed linguistic facts. For this purpose, it is imperative to investigate and clarify derivational properties of \(C_{HL}\), since merely stipulating representational conditions such as filters, obscures the nature of \(C_{HL}\). Thus, one important issue is to look for the best derivational model and to enhance the explanatory/predictive power of the theory.

In the book under review, Derivations in Minimalism (henceforth DM), Epstein and Seely (henceforth E&S) develop a strong derivational model of \(C_{HL}\). Its main feature is to abandon any representational constructs such as syntactic relations defined on trees or filters. Note that representational postulates lack explanatory depth and should be reduced to the derivational nature of the computational system. The idea behind this is that there is no substantive opposition between derivational theories and representational theories to the extent that derivational information is encoded on represen-

* I would like to express my deepest gratitude to three anonymous EL reviewers for their constructive comments. I am also grateful to David Fairweather for suggesting stylistic improvements. Needless to say, all remaining errors and inadequacies are solely my own.

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tations. "Thus, 'representational' theories are in fact, just one kind of the derivational theory" (E&S (2006: 45)). This further implies that any representational "coding tricks" should be subject to close scrutiny and given a deeper explanation in terms of derivation.

Generally speaking, unclarity of postulates always threatens the entire theory. E&S point out that this is the case even in the minimalist program. Specifically, postulating chains and the EPP raises a number of serious problems. They argue that such unclear constructs should be eliminated from the grammar. They claim that chains are not legitimate syntactic objects and hence should be eliminated. They substantiate their claim by proposing that there is no successive cyclic A-movement. This proposal further implies that the EPP is eliminable as well. They demonstrate that the EPP is not independently motivated by careful examination of existing data and analyses.

In this review article, I will evaluate their proposal concerning the derivational architecture of the computational system by examining their derivational model with special reference to the role of the Cycle. In their strong derivational model, PF and LF interpret/evaluate syntactic objects at every step of the derivation. This means that closed syntactic units, such as phases in the sense of Chomsky (1998 and later), play no substantial role in the computation. However, I will claim that the notion of the Cycle should not be eliminated on the basis of evidence for successive cyclic wh-movement and reject their phase-free approach by presenting data suggesting that interpretation/evaluation might be a cyclic process as originally claimed by Jackendoff (1972).

This review is structured as follows. Section 2 gives a brief outline of the book. Section 3 critically evaluates their phase-free derivational model by illustrating the following two points. First, their hypothesis that the Cycle can be eliminable together with strong features seems seriously flawed (cf. section 3.1). Second, there exist cases in which interpretation/evaluation has to be delayed until a certain derivational unit is formed (cf. section 3.2).

2. Outline of the Book

The book consists of five chapters. Chapter 1, "Orientation and goals," states the theoretical stance and aims. The main goal is to give a deeper explanation of linguistic facts by deduction within the minimalist program, but crucially, it does not cover empirical facts by stipulating ad hoc descrip-
tive devices such as filters, since any representational constructs, including filters and syntactic relations defined on trees, are non-explanatory. To achieve this explanatory goal, it is necessary to adopt a derivational approach to syntactic relations, which aims at answering the fundamental question of why they exist by deducing such "representational coding tricks" from the properties of the syntactic derivation.

Any deductive argument presupposes that a theoretical postulate or a principle makes clear empirical predictions. Unclearness of a theoretical postulate is a serious empirical problem for any scientific research. So to examine what a principle predicts should be an important empirical issue.

E&S cautiously examine two basic concepts, namely chains and the EPP, pointing out that they pose serious empirical problems. Chains are representational constructs; nevertheless, they are neither syntactic objects nor interpretable objects. We go back to details of this point directly. The EPP is also a suspect principle. Its formulation has been unclear since its origin. It is redundant with other independently motivated grammatical mechanisms such as (Case-)Checking Theory, Null Complementizer Theory, Movement and Locality Theory and so on. In the following chapters, E&S try to solve problems with chains and the EPP.

In Chapter 2, "Elimination of A-chains," E&S take up problems with chains. They claim that chains should be abandoned, proposing that A-movement is one-fell-swoop.

Given the Inclusiveness condition, movement leaves copies but not traces. For example, although it has traditionally been assumed that the occurrences, Mary\(^1\) and Mary\(^2\), are not identical in (1a), they are actually one and only one thing. In order to formulate chains, we have to distinguish between these different occurrences of the copy Mary in terms of the positions they occupied. If we adopt Chomsky's (1995: 252) formulation, where each position is identified by referring to its sister (co-constituent), the chain of Mary in (1a) is defined as the pair of positions occupied by the different occurrences of Mary, as shown in (1b):\(^1\)

\[
\begin{align*}
(1) & \quad a. \quad \text{Mary}^1 \text{ was arrested Mary}^2 & (E&S \ (2006: \ 16)) \\
& \quad b. \quad \{\langle \text{Mary}^1, \{\text{was} \ \{\text{was}, \{\text{arrested} \ \{\text{arrested, Mary}^2\}\}\}\}, \langle\text{arrested Mary}^2\rangle\}. & (E&S \ (2006: \ 18))
\end{align*}
\]

\(^1\) Although technical questions concerning the notation of chains still remain open, if we adopt the original notation in Chomsky (1995), (2b) would be something like (i):

(i) \quad \{\langle \text{Mary}^1, \{\text{was} \ \{\text{was}, \{\text{arrested} \ \{\text{arrested, Mary}^2\}\}\}\}, \langle\text{Mary}^2, \text{arrested}\rangle\}
E&S convincingly show that (1b) is highly problematic at least for the following three reasons. First, chains are not legitimate syntactic objects accessible to syntactic computation, because the alleged A-chain does not satisfy any of the conditions listed in (2):

(2) Syntactic Object
   a. Lexical items
   b. $K = \{g, \{a, b\}\}$, where $a$, $b$ are objects and $g$ is the label of $K$
   c. $K = \{g, \{a, b\}\}$, where $a$, $b$ are features of syntactic objects already formed. (E&S (2006: 14–15))

Second, given the X’ Invisibility Hypothesis in (3), chains cannot even be interpreted at the interface because they necessarily contain invisible X’ projections:

(3) X’ Invisibility Hypothesis
A category that does not project any further is a maximal projection $XP$, and one that is not a projection at all is a minimal projection $X_{min}$; any other is an X’, invisible at the interface and for computation. (E&S (2006: 21))

Since a mover always occupies a spec position, its sister is inevitably an invisible X’. For instance, in (1b), the sister to the mover Mary$^1$ is the intermediate projection $\{\text{was} \ \{\text{was}, \ \{\text{arrested} \ \{\text{arrested}, \ \text{Mary}^2\}\}\}\}$, which is, by definition, invisible at the interface and for computation.

Third, chains are redundant with the irreducible syntactic operations, Merge and Move. Information encoded in chains can be deduced from the properties of these operations. Chomsky (2001) and Lasnik (2003a) suggest that the X’-invisibility problem with specification of occurrences of a copy can be avoided by referring to the mother relation but not the sister relation. However, this cannot be a real solution because such syntactic relations are already contained in the application of the syntactic operations.2

If chains cannot be formulated in the minimalist program, a question immediately arises as to how they can be eliminated without losing relevant

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2 In Chomsky (1995) chains no longer represent the history of movement. This implies that there is no move/chain duplication. See E&S (2006: 31–42) for problems with this view, which I do not address. The reason is that problems lie in the assumption that occurrences of a single copy are not identical, the assumption abandoned in Chomsky (1998 and later).
information. If movement and chains are completely overlapped, relevant information encoded in a chain can be read off in the course of the derivation. E&S propose the one-fell-swoop A-movement, by pointing out a number of problems with the postulation of a successive cyclic A-chain in Chomsky (1995). Note that their proposal does capture the gist of the Chain Condition (cf. Chomsky (1986)): “An A-chain is headed by a unique Case position and must terminate in a unique theta position” (E&S (2006: 37)). The condition says that legitimacy of an A-chain can be determined by evaluating its head and tail. Thus, as shown in (4), Bill starts from a theta position and moves directly to a Case position, skipping the intermediate A-position, the spec of the raising infinitival to.

(4) Bill seems to Bill sleep a lot

One of the important theoretical consequences of this proposal is that the EPP cannot be a principle of UG. In Chapters 3 and 4, E&S convincingly demonstrate that postulating the EPP also causes serious problems (cf. E&S (2006: Ch. 3)) and claim that evidence in favor of the EPP is not strong enough to support it, contrary to what has been implicitly assumed (cf. E&S (2006: Ch. 4)).

In Chapter 3, “On the elimination of EPP,” E&S provide arguments against the EPP. The EPP is a suspect principle in that its nature is unclear; it is redundant with other principles, is inadequate since it does not hold universally and might lack independent motivations.

In order to justify the claim that the EPP should be eliminated, E&S demonstrate that postulating the EPP not only makes wrong predictions for a number of empirical facts but also requires supplementary mechanisms that seem unnecessary once we discard the EPP.

For example, there exists a paradigm where the EPP apparently induces contradictions.

(5) a. *there is likely [a man to be [[a-man] outside].

b. I expect [a man to be [[a-man] outside].

(E&S (2006: 56))

(E&S (2006: 57))

If a man in (5) occupies the subject position of the raising infinitival to, why does such a contrast exist?

They argue that the contrast can be accounted for in a straightforward

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3 See Epstein et al. (1998) for elimination of other representational notions such as representational c-command.
fashion if the EPP does not exist. (5a) is ruled out since *a man* cannot move to the infinitival subject position, whereas (5b) is well-formed since *a man* moves to the Case position in the matrix clause. On the other hand, if we posit the EPP, we have to stipulate some supplementary mechanisms to block partial raising of *a man* in (5a) but force raising of *a man* in (5b). Chomsky (1995, 1998, 2000) accounts for the contrast in (5) by assuming a variant of the Procrastinate, "Merge over Move."

However, this derivational principle is problematic since it ends up with a famous undergeneration problem. The sentence (6a) which involves a "short passive," would not be generated under the "Merge over Move" approach. Suppose that TP and vP lacking an external theta role are not phases. Then both the expletive and the associate are contained in the same lexical sub-array. "Merge over Move" blocks the "short passive" of the associate and only generates (6b); thus (6a) could not be generated under the "Merge over Move" approach.

(6) a. there was a proof discovered [a-proof] (E&S (2006: 63))
   b. there was [there] discovered a proof (E&S (2006: 63))

Note that "Merge over Move" and the notion of the lexical sub-array are supplementary mechanisms that are necessary only to maintain the EPP account of (5).

It should be noted that this kind of problem never occurs under E&S's approach. They eliminate the EPP and hence, they do not assume the competition between Merge and Move. The examples just discussed indicate a typical case where "the EPP is in fact engendering a number of serious problems which in turn motivate a series of problematic solutions" (E&S (2006: 56)).

They further discuss two types of ungrammatical examples which seem to be accounted for only by the EPP. One is the BELIEVE-class verbs. They take a raising infinitival as their complement but assign no accusative Case (cf. Brody (1993), Bošković (2002)). Thus, from the data involving verbs belonging to this class, we would be able to check whether the EPP exists in a Case-less A-position. The relevant example is given in (7):

(7) *John has conjectured [___ to seem Peter is ill] (E&S (2006: 71))

Lasnik (2003a) suggests that the example (7) might motivate the EPP because without appeal to the EPP, it is difficult to block (7), where an expletive is omitted in the embedded subject position.

Acknowledging that the data involving the BELIEVE-class verbs are not
so clear, E&S, however, argue that *conjecture* can assign the accusative Case, if the data in question are modified properly:

(8) John has conjectured Mary’s illness to have upset Fred.

(E&S (2006: 77))

On the basis of the acceptability of (8), they claim that the ungrammaticality of (7) no longer motivates the EPP. It is ruled out for the reason irrelevant to the EPP: the verb *conjecture* fails to discharge its accusative Case.

The other type of examples that motivates the EPP is the generalization that nouns cannot take an infinitival complement of the control type (cf. Lasnik (2003a)):

(9) *[the conjecture [_ to be likely that Fred left]] was false

(E&S (2006: 103))

Although (9) could be ruled out by the EPP since the subject position of the infinitival clause is not filled, E&S claim that (9) does not motivate the EPP, because it can be accounted for by the theory of null complementizer, which they claim is independently motivated. Assuming that the infinitival complement of the noun *conjecture* is a CP projection (cf. Ormazabal (1995)) and the null C is a PF affix that requires +V category as its lexical host (cf. Bošković and Lasnik (2003)), they claim that (9) is ruled out since the null affix C_{<affix>} cannot find its appropriate host as illustrated in (10), which corresponds to their (149) with modification in notation (cf. E&S (2006: 104)):

(10) *[the conjecture [CP C_{<affix>}_ to be likely that Fred left]] was false

In Chapter 4, “More challenges to the elimination of the EPP: some movement cases,” E&S examine “intermediate EPP” effects, which can be regarded as evidence for successive cyclic A-movement, and try to present new interpretations for relevant facts. More concretely, they discuss the following four kinds of data, which seem to suggest that a DP moves through the subject position of a non-control infinitive.

(11) Condition A

a. *Bill appears to Mary₁ ___ to seem to herself₁ to be ill.
b. Bill₁ appears to Mary₂ ___ to seem to himself₁ to be ill.

(E&S (2006: 131))

(12) Q-float

The students₁ seem [__₁ all] to know French

(E&S (2006: 115))

(13) Reconstruction

a. *His₁ mother’s₂ bread seems to her₂ ___ to be known by every man₁ to be the best.
b. His mother's bread seems to every man to be known by her to be the best. (E&S (2006: 115))

(14) Partial raising in ECM constructions
a. The mathematician made every even number out not to be the sum of two primes. (every > Neg, *Neg > every)
b. The mathematician made out every even number not to be the sum of two primes. (every > Neg, Neg > every)

In previous studies, the examples in (11)–(13) have been accounted for on the basis of the assumption that the DP in question has moved through the subject position of the non-control infinitival clause (indicated by "__"), leaving its trace/copy behind. The examples in (14), which involve the scope interaction between a universal quantifier and negation, have been accounted for on the basis of the assumption that "a subject universal quantifier can be understood inside the scope of clausal negation only if it has not raised away from the subject" (cf. E&S (2006: 167)); thus every even number in (14b) has been assumed to stay in the subject position of the infinitival clause.

Although E&S do not seem to succeed in providing full-fledged alternative analyses for the phenomena, they certainly indicate that the phenomena require extra devices even in previous studies defending the (intermediate) EPP. Importantly, many of such extra devices are hard to translate into the restrictive derivational theory. Thus, the alleged evidence in favor of the "intermediate EPP" does not support postulation of the EPP in the strict sense. Therefore "intermediate EPP" effects are not strong enough to dismiss the one-fell-swoop A-movement hypothesis.

In Chapter 5, "Exploring architecture," E&S explore their derivational model from a broader theoretical perspective. As mentioned earlier, their derivational model is phase-free since both PF and LF necessarily interpret objects of each transformational operation (Merge and Move), which can be schematized in (15):

\[(T=\text{transformational operation, and } R=\text{representation})\]

(E&S (2006: 179))
In (15) *interpretation/evaluation* is assigned to the output of each derivational step and cannot be postponed until the relevant phase is completed. This model also implies that there is no distinction between overt versus covert movement, or no interdependent LF or PF cycle.

E&S explore three issues under their phase-free derivational model. The first issue concerns the nature of syntactic violations in their derivational model. In the GB framework, if there appears at least one violation at any point in the derivation, the derivation is ill-formed, yielding an ungrammatical sentence. However, we cannot adopt this view of violations. If we did so, we could generate no well-formed sentence. For example, consider the derivation of the sentence *Birds like seed*. If a violation at any point caused the derivation to crash, the sentence in question would never be generated because it would violate the Theta Criterion at the step where the intermediate representation *[like+seed]* is created by Merge. They call this the Guttmann problem. One implication of the Guttmann problem is that the status of violations in the derivational model is completely different from that in the GB model.

Their solution to the Guttmann problem is that a violation at one derivational point is not necessarily retained in later points: a violation does not necessarily yield a persistent crash. They propose (16), claiming that each newly generated syntactic object is assigned a new PF and LF interpretation:

(16) Each syntactic object O generated at each derivational point P is evaluated by PF and LF, which, naturally enough, assess the properties of O, i.e. the legitimacy of O. (E&S (2006: 182))

The gist of (16) is that even if the syntactic object *[like+seed]*, created at the first step of the derivation, violates the Theta Criterion, the violation in question is not retained in the case under discussion. The Theta Criterion is satisfied by evaluating the bigger syntactic object *[Birds+ [like seed]]*. In short, each output of each transformational rule application is evaluated and its new and unique properties are assessed.

The second issue concerns elimination of strong features. Since the introduction of the notion of feature strength in Chomsky (1995: Ch. 3), it has been assumed that variants of strong features drive category movement. However, E&S claim that there are no special features triggering category movement and try to eliminate strong features all together. If strong features are entirely eliminated from the system, what derives category movement? They suggest that the effects of strong features are deducible from properties of feature checking.

To begin with, let us consider (17):
There are three men outside. (E&S (2006: 175)) Recall that the EPP is eliminated. So the first question is what feature there checks. E&S argue, following Belletti (1988) and Lasnik (1995), that the expletive there is a pure Case checker and the copular are assigns a partitive Case to the associate three men. Given that there is no covert Cycle, agreement-features of the matrix T have to be checked with agreement features of the associate via Agree.

If so, another question arises as to why a Case feature of a man cannot be licensed via Agree in (18). In other words, what forces raising of a man in (18)?

*Will be a man outside

E&S point out that there is a fundamental difference between interpretable features and uninterpretable ones. Assume that agreement features of DP are interpretable but agreement features on T and Case features are uninterpretable. (17) differs from (18) in interpretability of features of the goal. In (17), agreement features of the goal DP are interpretable while in (18) a Case feature of the goal DP is uninterpretable.

E&S propose that an element with uninterpretable features must act as a probe. In (18), raising of a man to the spec of T is forced. A man contains an uninterpretable Case feature and must raise to the position from where it can act as a probe. In short, E&S suggest that the driving force of category movement is attributed to properties of feature checking; strong features are also eliminated.

3. Discussion

One consequence of the derivational model proposed by E&S is that the Cycle or phase plays no role and should be eliminable. In this section, I evaluate their phase-free deviational model by speculating on the question of whether we can discard the notion of the Cycle.

The Cycle has at least two aspects. Syntactically, it constitutes a closed syntactic unit, forcing movement to be successive cyclic (cf. Chomsky (1973, 1998 and later)). Semantically, it serves as a unit for interpretation. If the Cycle were really eliminable as argued by E&S, it is predicted that the effects of successive cyclicity and cyclic interpretation ought to be able to be derived from other independently motivated derivational mechanisms. But I suggest that this is not the case. Their phase-free derivational model encounters a number of problems if it discards the notion of the Cycle.
In section 3.1, I will demonstrate that if we discard both the Cycle and strong features, we might lose any explanation of successive cyclicity in A'-movement. In section 3.2, I argue that interpretation/evaluation does not apply until a certain syntactic unit is built, which might undermine their proposal that interpretation/evaluation apply to syntactic output at each derivational step.

In what follows I discuss A'-movement and Japanese scrambling which E&S leave open for future research. It is true that E&S do not claim that A'-chains are eliminable. But the following argument is independent of the postulation of A'-chains. What I would like to show is that some effects of strong features remain unexplained if we discard the notion of the Cycle from the grammar. This might in turn imply that, given their derivational architecture, it is hard to maintain the claim that strong features can be eliminated.

3.1. Successive Cyclicity in A'-movement, Strong Features and the Cycle

As discussed at the end of section 2, E&S eliminate EPP-like features of any kind entirely from their system, claiming that categorical movement is forced by some uninterpretable feature on a mover. As far as there is no successive cyclic movement, this claim can be maintained. However, the claim poses a serious problem if evidence for successive cyclic movement is solid.

This subsection discusses three pieces of compelling evidence for intermediate steps of wh-movement, and then suggests that it is impossible to eliminate the notion of the Cycle together with the strong features.

There is overwhelming evidence in defense of successive cyclic A'-movement.4 5 First, intermediate "reconstruction" effects in English indicate that A'-movement is successive cyclic.6 The acceptability of (19c) is predictable only if the wh-phrase which friends of each other moves to the

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5 As for wh-inversion, see Kayne and Pollock (2001) for French and Torrego (1984) for Spanish. However, I leave open the question of whether wh-inversion should count as another piece of evidence for successive cyclic wh-movement.

6 As for reconstruction effects in English, see Barss (2002) for an overview.
spec of the matrix CP, via the position of $t_1'$.

(19) Condition A

a. *They said [CP that I should talk to friends of each other].

b. They wondered [CP [which friends of each other]_1 [IP I should talk to $t_1$]].

c. [CP [Which friends of each other]_1 did they say [CP $t_1'$ that [IP I should talk to $t_1$]]]?  
   (Sabel (2002: 262))

Second, the distribution of the floating quantifier all in West Ulster English (a dialect of Irish English) also suggests the same conclusion. McCloskey (2001) argues that the position of all indicates the intermediate steps of wh-movement. Given this, consider (20):

(20) Wh-quantifier float in West Ulster English

a. What all did he say (that) he wanted $t$?

b. What did he say (that) he wanted all?

c. What did he say all (that) he wanted $t$?
   (McCloskey (2001:61))

The case at issue is (20c). It also indicates that the wh-phrase moves through the spec of the intermediate CP.

Finally, consider wh-copying colloquial German:8,9

(21) a. Wie glaubst du, wie sie das gelöst hat?
   how believe you how she that solved has
   ‘How do you believe that she has solved that?’

b. Warum glaubst du, warum sie das getan hat?
   why believe you why she that done has
   ‘Why do you believe she has done that?’

c. Wovon glaubst du, wovon sie träumt?
   of.what believe you of.what she dreams
   ‘What do you believe that she dreams of?’
   (Felser (2004: 549))

7 Exactly the same point can be made with Condition C. The contrast in (i) indicates that the wh-phrase moves through the spec of the intermediate CP:

(i) Condition C and Variable Binding

a. [Which (of the) paper(s) that $he_1$ gave to Ms. Brown$_2$] did every student$_1$ hope $t'$ that she$_2$ will read $t$?

b. *[Which (of the) paper(s) that $he_1$ gave to Ms. Brown$_2$] did she$_2$ hope $t'$ that every student$_1$ will revise $t$?  
   (Fox (1999: 173))


Given that lower copies of a *wh*-phrase reflect intermediate stages of successive-cyclic *wh*-movement, these *wh*-phrases move through the spec of the intermediate CP in (21). In short, evidence for successive cyclic A'-movement is robust and persuasive.

Suppose that overt category movement is forced by the *uninterpretable* features of a mover. Assume further that every step of movement is motivated by some feature checking requirement. Given these, intermediate steps of *wh*-movement would be motivated by some *uninterpretable* feature on a mover, a *wh*-phrase.

Then the question is: What motivates movement into the spec of the intermediate CP in these cases? Suppose that we could assign some *uninterpretable* features to a *wh*-phrase that undergoes successive cyclic movement. Consider (22):

(22) a. Who did Mary like?
    b. Who did you say Mary liked?
    c. Who did you say John believed Mary liked?
    d. Who did you say John believed Mary claimed ...?

Each *wh*-phrase should be different from other *wh*-phrases in the number of *uninterpretable* features that motivate intermediate steps of movement. How many *who* does a native speaker of English have in s/her lexicon? Given the recursive nature and the creative aspects of human language, such sentences can be infinitely long, and hence s/he must have an infinite number of the *wh*-phrases in s/her lexicon. But this is highly unlikely.

The source of the problems is elimination of all EPP-like (strong) features from intermediate landing sites. So we have to admit, at least in some cases, movement “indirectly” motivated by the feature-checking requirement. Thus a condition like (23) is necessary:

(23) The head H of a phase PH may be assigned an EPP- and P[eripheral]-feature
    (Chomsky (1998: 23))

This implies, contrary to what E&S assume, that the notion of the Cycle does play a role in the computation system. The “free” assignment of p-

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10 An anonymous reviewer poses the question of exactly what *uninterpretable* features motivate successive cyclicity. I leave this question open. Note, however, that the present discussion does not hinge on the nature of the *uninterpretable* features in question.
features reflects properties of phase, a variant of the Cycle.11

This reasoning, if correct, implies that their phase-free derivational model is hard to maintain. Thus, we expect that there might be other cases that suggest the cyclic computation.

3.2. Problems with A-scrambling: Reevaluation

In this section, I further reinforce the argument that the notion of the Cycle is necessary by pointing out cases where E&S’s phase-free derivational model does not make correct predictions.

11 An anonymous reviewer raises the question of whether the “free” assignment of p-features is theoretically problematic in the first place because it amounts to saying that movement may not be purposeful, thus weakening explanatory power. This question has at least two aspects to consider. First, is every movement really purposeful? This restrictive assumption is theoretically attractive. But its validity depends on empirical facts. The question is whether we maintain the assumption without recourse to any ad hoc assumption. To my knowledge, we have not succeeded in demonstrating that every step of movement is motivated by feature-checking requirements. For example, we do not know exactly what motivates the clause-internal scrambling in Japanese. Bošković and Takahashi (1998) propose that scrambling is an LF lowering operation driven by the theta-checking requirement, on the assumption that theta roles are formal features that have to be checked. But there still remains a controversial issue of how we translate their lowering analysis into the current phrase structure theory. If it turns out that there is no room for any lowering analysis, we have to assume/stipulate some feature F, in order to maintain the assumption that every movement is purposeful. The assumption implies that if something moves, there is some feature that motivates the movement. I could not see any substantial difference between this statement and (i):

(i) If something is extracted out of a phase PH, the head of PH is assigned a p-feature.

If the present reasoning is correct, p-features themselves are not guilty. Second, how should we restrict p-feature assignment? Obviously, some restrictive theory of p-features is required, since free assignment of p-features induces overgeneration problems. A typical case would be (ii).

(ii) *Who will whom kill?

(iii) Who did you kill?

Assume that whom raises to the outer edge of vP. If free assignment of p-features is possible, it is not clear why (ii) is deviant. So the question is whether we can predict the correct assignment of p-features in a derivational perspective. I have no satisfactory answer to this question. A speculation is that an answer might lie in some properties of movers. In (iii), the mover whom behaves as if it “knows” when it should finish its movement. The difference between (ii) and (iii) might suggest (iv):

(iv) P-features activate all the uninterpretable features on a mover.

Although many technical questions remain open, in order to restrict p-feature assignment, we might need to deduce (iv) from some independently motivated assumptions.
Many licensing conditions of the “anywhere” type, such as Condition A, could be nicely translated into any derivational framework.\(^{12}\) Consider (24) and (25):

\[(24)\]
\[
a. \text{Otagai-no sensei-ga gakusei-o sikatta.} \\
\quad \text{each other-Gen teacher-Nom students-Acc scolded} \\
\quad \text{‘Students, each other’s teachers scolded.’} \\
b. \text{Gakusei-o otagai-no sensei-ga sikatta.} \\
\quad \text{students-Acc each other-Gen teacher-Nom scolded} \\
\quad \text{(Bošković and Takahashi (1998: 362))}
\]

\[(25)\]
\[
\text{Gakusei-o John-ga futari sikatta.} \\
\quad \text{students-Acc John-Nom two scolded} \\
\quad \text{‘Students, John scolded two.’} \\
\quad \text{(Bošković and Takahashi (1998: 362))}
\]

Suppose that reciprocal pronouns must be c-commanded by their antecedent in the local domain.\(^{13,14}\) (24b) is well-formed since the reciprocal pronoun is licensed when the scrambled object is merged with the matrix TP, whereas (24a) is deviant since such a relation is not created in the course of derivation. Adapting Miyagawa’s (1989) analysis of floating numerals, assume that a floating numeral and its associate must mutually c-command each other at some point in the derivation. In (25), the relation between the object and the floating numeral is licensed before it undergoes scrambling.

So far, distributions of reciprocals and floating numerals can be determined by looking at the particular points of derivation. In other words, the data (24a) and (25) seem to suggest that LF immediately interprets/evaluates syntactic objects at every point of the derivation. However, if we combine the two licensing conditions, correct outcomes are unpredictable under their derivational model. Now observe (26):

\[(26)\]
\[
*\text{Gakusei-o otagai-no sensei-ga futari sikatta.} \\
\quad \text{students-Acc each other-Gen teachers-Nom two scolded} \\
\quad \text{‘Students, each other’s teachers scolded two.’}
\]

Under E&S’s derivational model, it is totally unclear why (26) is degraded, since its derivation certainly contains the steps where the floating numeral

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\(^{12}\) See Kitahara (2002) for a derivational approach to binding relations in Japanese.

\(^{13}\) I use the term “c-command” only for exposition.

\(^{14}\) I set aside the issue concerning the proper formulation of Condition A. See Chomsky (1995: Ch. 1) for this point.
and the reciprocal are licensed. As for the floating numeral, it should be licensed before scrambling applies to its associate (cf. (25)); as for the reciprocal, it should be licensed at the derivational point where the scrambled object merged with TP, since the c-command requirement for reciprocal binding is satisfied at that step.

What does (26) imply, then? It implies that reinterpretation/reevaluation of relations would be necessary under their derivational approach. At some earlier point in the derivation, the association between the scrambled object and the numeral is interpreted/evaluated by LF; however the deviance of (26) indicates that the relation has to be reinterpretation/reevaluated at the step where the scrambled object merged with TP. For some reason, the relation established at some point in the derivation is discarded at a later point in the derivation. This does not seem to fit the grand idea that derivational approaches embrace, because the minimalist program asks how perfect language is and one measure for “perfectness” would be computational efficiency. Reinterpretation/reevaluation would be a departure from this minimalist tenet.

The origin of the problem lies in the assumption that LF immediately interprets/evaluates syntactic objects at every point of derivation. In order to circumvent the problem, we have to assume that interpretation/evaluation has to be postponed until a certain domain is created. In addition to this, we need some condition like (27):

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15 A similar paradigm is also found in English:
(i) a. Someone seems (to Bill) to be reviewing every report. (Hornstein (1998: 103))
    b. Someone; seemed to himselfi to be reviewing every report. (Hornstein (1998: 104))
(ii) a. (ia) → some > every, some < every
    b. (ib) → some > every, *some < every

The paradigm is the so-called trapping effects in the sense of Lebeaux (1995). The ambiguity of (ia) suggests that A-“reconstruction” is optional. To put this in derivational terms, the existential quantifier in (ia) can be interpreted at a certain derivational step where it is inside the infinitival clause. In (ib), however, this lower scope option disappears when the universal quantifier binds the reflexive.

16 E&S (2006: 178 fn. 4) discuss the following example, suggesting that interpretation of the anaphor can be delayed or it is a logophor.
(i) Which picture of himself,j did Billi say that Tomi liked best?
However, such possibilities are irrelevant to (26).

17 The nature of (27) is not clear at all. This seems to suggest trapping effects in the sense of Lebeaux (1995) are relevant for Japanese scrambling. I leave this issue open. See Lebeaux (1995) for the basic idea.
(27) Only one occurrence of a copy created by A-movement is interpreted.

Given the two assumptions, only one occurrence of gakusei-o in (26) is interpreted by LF. Consider (28):

(28) *Gakusei-o otagai-no sensei-ga gakusei-o
      students-Acc each other-Gen teachers-Nom students-Acc
      futari sikatta.
      two scolded
      'Students, each other's teachers scolded two.'

In (28), the two requirements are conflicting. The reciprocal demands that LF interpret the higher occurrence of the copy Gakusei-o while the numeral demands that LF interpret the lower one.

One might think that (27) is representational. Note, however, that the condition applies to the domain of phase but not necessarily to the whole structure. Assume that A-movement does not cross a phase boundary. If interpretation/evaluation applies to the domain of phase, we have a partial answer to the question as to when LF interprets syntactic objects. Interpretation/evaluation is postponed until phases are created. If this reasoning is on the right track, then the notion of the Cycle such as phase reflects an intrinsic property of the computational system.

4. Concluding Remarks

DM's main claim can be summarized in (29):

(29) a. Chains are neither legitimate syntactic objects nor interpretable objects at the interface.
    b. A-chains can be eliminable if A-movement is one step. If A-movement is not successive cyclic, the EPP is eliminable.
    c. Evidence for the EPP is not conclusive.
    d. Interpretation/evaluation applies to output at each application of each syntactic operation.
    (The phase-free derivational approach)
    e. On the assumption that an element with uninterpretable

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18 The present argument, if correct, virtually claims that vP is not a phase. A related issue might be the light verb construction discussed in Hoshi and Saito (2000). One of their basic insights is that theta-role assignment is more flexible in some languages than generally assumed. Such properties might be reducible to the nature of v. I leave open the question of whether Japanese vP is a phase or not.
features must act as a probe, features posited for triggering category movement such as the EPP and strong features are eliminable.

As for (29a), there is no room for argument since their argument is deductive and based on reasonable premises. As for (29b), this is certainly one direction we can take. What we need in order to eliminate chains is to establish isomorphism between chains and movement. In fact, as discussed in 3.1, (29e) is hard to maintain as far as successive cyclic movement does exist. The assumption that an element with uninterpretable features must act as a probe is problematic and it has to be modified or discarded if one wants to eliminate movement indirectly motivated by feature-checking. As discussed in 3.1, and 3.2, the notion of Cycle is necessary, since interpretation/evaluation applies to each syntactic unit.

DM not only presents important insights into chains, the EPP, and derivational architecture of human language, but also demonstrates what a serious theoretical investigation is.

REFERENCES


[received 23 October 2007, accepted 1 July 2008]