ON EXTRAPosition FROM NP CONSTRUCTIONS: 
A PHASE-BASED ACCOUNT

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This paper explicates grammatical properties of Extraposition from NP (ExNP) constructions in English in terms of the Phase Theory in Chomsky (2008). We assume that Edge Features (EF) in phase heads can be a driving force for rightward mergers (linearly unrestricted EFs) and transmitted from phase heads to their selecting heads due to the derivationally interpretive mechanism (EF-inheritance). These phase-based assumptions allow extraposed phrases to be adjoined to the rightward position in a single transferred domain where a modification relation can be derivationally formed between relevant phrases and their host DPs. Finally, we show that our approach can be successfully extended to Secondary Predicate (SP) constructions.*

Keywords: Extraposition from NP, Feature Inheritance, phase, Transfer, Secondary Predicate

1. Introduction

In recent minimalist studies by Chomsky (2001, 2004, 2007, 2008), syntactic structures are constructed in a bottom-up fashion, successively sending the relevant part off to both sensorimotor (SM) and Conceptual-Intentional (C-I) interfaces by the operation of Transfer, which is followed by phonological/semantic interpretations. This derivational view enables us to construct the theory more economically, since the syntactic computation deals with only limited parts of the syntactic structure due to the successive Trans-

* This is a revised and expanded version of my paper, which was originally given at the 26th Conference of the English Linguistic Society of Japan held at Tsukuba University in 2008 and subsequently published as Tanaka (2009). I am especially grateful to Nobuaki Nishioka for invaluable comments and suggestions. I would also like to thank the audience for helpful comments. My thanks also go to Christopher P. Carman and Stephen Laker for stylistic improvements, and three reviewers for helpful comments and suggestions. Needless to say, all remaining errors and inadequacies in the paper are my own.
fer. In particular, Chomsky (2008) focuses on the function of phases (CP and v*P) as a pivot for the syntactic derivation, and argues that their heads (C and v*) play a crucial role in commanding the derivation. This theory is called Phase Theory, and its main characteristics are summarized in (1):

(1) a. Phase heads (C and v*) have an Edge Feature (EF) and an Agreement Feature (AF), and then transmit the latter to the heads of their complements (T and V) obligatorily. (Feature Inheritance)

b. Both A'-mergers by EFs in phase heads and A-mergers by AFs on heads of their complements occur in parallel.¹

c. The application of Transfer sends the complement domain of phase heads to SM/C-I interfaces.

The most remarkable point in this theory is that there is a close relation between phase heads and the heads they select. Technically, T/V is introduced to the derivation without AF at first, and then it is provided by C/v* in the subsequent derivation. This mechanism, which is called Feature Inheritance, helps to minimize syntactic derivation, by relegating all grammatical functions to phase heads. With these assumptions of Phase Theory in mind, let us consider the derivation of a subject wh-question in English:

(2) a. Who arrived?

b. \[ [CP C \left[ \text{TP T}_{[\text{AF}]} \right] \left[ vP \ v \left[ vP \text{ arrived who} \right] \right] ] \]

c. \[ [CP who \left[ C' C_{[\text{EF}]} \right] \left[ \text{TP who} \left[ T' T_{[\text{AF}]} \right] \left[ vP \ v \left[ vP \text{ arrived who} \right] \right] \right] ] \]

(2a) involves the unaccusative verb (arrive), which requires the subject wh-phrase (who) to take the object position of the verb as its underlying position. In this structure, C gives AF to T, as in (2b). Then, both T's AF and C's EF motivates the merger of who in parallel, and Transfer is applied to TP, as in (2c).²

Although Chomsky (2008) does not consider rightward mergers, if rightward merger constructions take on some sort of syntactic properties, then

¹ The Phase Theory assumes that structure building formations are driven by iterated Merge, including Internal Merge (IM), which corresponds to traditional movement operations and External Merge (EM), which is a simple composition between two lexical units. In this paper, we follow this notion and temporarily refer to A-/A'-merger, instead of conventional A-/A'-movement.

² As Chomsky (2008: 150) notes, “By the usual demand of minimal computation, the A-chain contains no pronounced copy,” A-copies in the complement of V and the Spec-TP are not pronounced.
they should be derived syntactically, in the same way as the wh-move-
ment. In this respect, it is worthwhile to analyze Extraposition from NPs (ExNPs) construction, shown in (3) and (4) below:\(^3\)

(3) a. [A review of this article] came out yesterday.
   b. [A review ___] came out yesterday of this article. (ExSubj)

(4) a. John read [a paper of Chomsky’s] over the summer.
   b. John read [a paper ___] over the summer of Chomsky’s.

In general, this operation is optional and possible from inside the subject (ExSubj) as in (3b) and the object (ExObj) as in (4b). This subject/object applicability is also seen in the adjunct extraposition shown below:\(^4\)

(5) a. [A man ___] appeared with green eyes. (ExSubj)
   b. John read [a book ___] over the summer by Chomsky.

As clearly shown in (3)–(5), there is an interpretive relation between the subject/object DP and the extraposed element: the extraposed PP in the sentence-final position modifies the subject/object, as the underline notation indicates.

In addition, ExNPs clearly show syntactic properties:

(6) a. ?/*I gave himi [a picture ___] yesterday of John’si mother.
   b. I gave himi [a picture ___] yesterday from John’si collection.

(Fox and Nissenbaum (1999: 8–10))

   b. *I read [a book ___] [before reading an article pg] from
      John’s library. (Fox and Nissenbaum (1999: 8–10))

The contrasts between complement and adjunct PPs with respect to the Con-
dition C effect in (6) and the Parasitic Gap (PG) licensing in (7) suggest that ExNPs should be derived by syntactic mechanisms, since they are sen-
sitive to the structural relation between relevant lexical items.

The main purpose of this paper is to show that a new analysis based on

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3 In this paper, we use the underline notation for the original position of extraposed elements to show their potentially interpretive correlation with their host DPs. This includes the adjunct extraposition as in (5), where the IM does not occur from within relevant DPs, as shown later.

4 CP can also be a candidate for the extraposition. In (i), the relative clause which originally modifies the subject/object extraposes to sentence final position:

(i) a. [A book ___] appeared which was written by Chomsky. (ExSubj)
   b. I called [somebody ___] yesterday who I couldn’t stand. (ExObj)
Phase Theory explains the grammatical properties of ExNPs, clarifying their syntactic derivations. Two assumptions play a crucial role in our analysis. The first one concerns the directionality of syntactic mergers. We claim that mergers driven by EFs in phase heads can be operated both leftward and rightward. The second one is related to the Feature Inheritance. We argue that EFs can be given from phase heads to their selecting heads, on the requirement that extraposed elements and their host DPs derivationally form a modification relation in a single transferred domain.

This paper is organized as follows. Section 2 introduces some previous studies of ExNPs and points out their problems. Section 3 demonstrates the derivation of ExNPs based on the phase-based mechanisms. Section 4 explains the grammatical properties of ExNPs under our analysis. Section 5 extends our analysis to the Secondary Predicate (SP) construction. Finally, section 6 concludes the paper.

2. Previous Studies


Previous approaches for the syntactic derivation of ExNPs are roughly divided into two types. One is a base-generation approach, whereby the extraposed elements are directly attached to the derived position. The other is a movement approach, which raises the relevant elements from the base to the derived position. In this section, we examine Kayne (1994) as a representative of the former, and in 2.2, Fox and Nissenbaum (1999) as a representative of the latter.

Kayne claims that in the ExSubj as in (8a), the extraposed relative can optionally stay in the sentence-final position as a part of the complement of the verb and appear as a remnant after the relevant subject moves to the subject position, as shown in (8b). This analysis crucially depends on the Linear Correspondence Axiom (LCA) in (9):

\(8\)  a. Someone just walked into the room \textbf{who we don’t know}.
     b. Someone, just walked into the room [\textbf{who we don’t know}].

\(9\) Let X, Y be nonterminals and x, y terminals such that X dominates x and Y dominates y. Then if X asymmetrically c-commands Y, x precedes y.

(Kayne (1994: 119–120))

(Kayne (1994: 33))

This axiom dictates that the directionality of syntactic mergers is limited to the left, and Kayne’s approach for the derivation of ExNPs conforms to this rule.

This analysis, however, faces some problems. The first one is concerned
with the attachment site of extraposed elements. In Kayne’s analysis, the relevant elements correspond to remnants which appear in the VP internal position, as in (8b). This is untenable, which will be evident if we consider (10). Extraposed elements can escape out of the VP as in (10b). If the relevant elements are included in the VP as Kayne argues, this should be impossible:5

   (10)  a. [A MAN ___] came in with blond hair, and [a WOMAN ___] did [VP e] TOO.
         b. [A MAN ___] came in with blond hair, and [a WOMAN ___] did [VP e] with BROWN hair.
             (Culicover and Rochemont (1990: 30))

Moreover, Kayne’s analysis cannot offer an adequate configuration for the asymmetry related to the Condition C in the Double Object (DO) construction:

   (11)  a. *I sent her_i many gifts that Mary_i didn’t like last year.
         b. I sent her_i many gifts last year that Mary_i didn’t like.
             (Culicover and Rochemont (1990: 29))

This contrast demonstrates that the coreferential interpretation between the pronoun (her) as a direct object and the R(eferential)-expression (Mary) within the extraposed relative becomes possible if the clausal extraposition takes place as in (11b), unlike the sentence without the extraposition as in (11a). In this approach, the relative clause in (11b) directly corresponds to the remnant within VP, and then the R-expression in it must be asymmetrically c-commanded by the pronoun in violation of the Condition C, which is contrary to fact.

2.2. The QR-based Approach: Fox and Nissenbaum (1999)

Fox and Nissenbaum (1999) argue for a minimalist account of the derivation of ExNPs, following Lebeaux (1991), and claim that there is a derivational difference between complement and adjunct ExNPs. Under this proposal, the former is derived by the movement of the extraposed element, as shown below:

   (12) [ [Subj/Obj DP Ex ] Ex ]

In contrast to this, the latter requires two steps. The first step is a right-

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5 Capital notations in (10) mean that the relevant expressions bear contrastive stress. About the focus interpretation for ExNPs, see Huck and Na (1990).
ward Quantifier Raising (QR) of the host DP, as in (13a). This DP is pronounced in the base position but not in the derived position, since the QR is a covert movement operation which affects no phonological realization of the derived copy. The next step is the adjunction of the extraposed element to the derived DP as in (13b):

(13) a. [([Subj/Obj DP] DP)]
   b. [([Subj/Obj DP] DP + Ex)]

The central idea of Fox and Nissenbaum’s analysis, which claims that the derivational mechanism is different between complement and adjunct extrapositions, seems to be valid. In fact, this analysis successfully captures the asymmetries between them in (6) and (7), as repeated below:

(14) a. */I gave him [a picture __] yesterday of John’s mother. (= (6a))
   b. I gave him, [a picture __] yesterday from John’s collection. (= (6b)) (Fox and Nissenbaum (1999: 8–10))

(15) a. I read [a book __] [before reading an article pg] about John. (= (7a))
   b. *I read [a book __] [before reading an article pg] from John’s library. (= (7b)) (Fox and Nissenbaum (1999: 8–10))

According to Fox and Nissenbaum, the complement extraposition leaves its copy in the host DP, which violates the Condition C in (14a). Moreover, given the general assumption that PG must be licensed by A*-merged elements (cf. Engdhal (1983)), and the extraposition is categorized as a syntactic A*-merger, then the PG can be licensed by this IM in (15a). On the other hand, the adjunct extraposition leaves no copy in the host DP since it is derived by the direct adjunction to the unpronounced DP. This then avoids the binding sensitivity as in (14b), and does not satisfy the licensing requirement for the PG, hence resulting in the ungrammaticality as in (15b).

This approach, however, leaves some theoretical issues unanswered in the minimalist perspective. First, it is unclear why the rightward QR is applied only for ExNPs, unlike the standard QR. Without some principles to regulate the directionality of QR, it seems to be an ad hoc assumption. Moreover, this QR must also be applied to definite DPs, as in (16) below:

(16) a. I saw [the (best) picture __] yesterday from the museum.
   b. I heard [the same rumor __] yesterday that you were spreading. (Fox and Nissenbaum (1999: 8))
Under the explanation in Fox and Nissenbaum (1999), the derivation in (16) involves the QR of the definite DP. However, the applicability of QR to the definite DP is controversial, and therefore it is necessary to explain the reason why the obligatory QR is applied to the relevant DPs in (16).

3. Alternative Assumptions and Analysis

3.1. Directionality of the Syntactic Merger

In Chomsky (2008), it is assumed that the merger operation targets two syntactic objects $X$ and $Y$, and hierarchically forms a new object $Z=\{X,Y\}$. From this assumption follows (17):

\[(17) \text{The syntactic merger has no directionality restriction.}\]

In principle, we assume that the merger operation is order-free, but the one involved with phase heads should be order-sensitive, so that the merged elements in this case can gain relevant interpretations at the C-I interface; namely, it is assumed that this type of merger can be applied leftward or rightward. For example, a $wh$-phrase in the English $wh$-question needs to reach in the left-peripheral position at the final stage of the derivation to get the appropriate interpretation at the C-I interface (Chomsky (2008: 151)). In this regard, it is interesting to consider how the ungrammaticality in (18) is derived in the framework of Chomsky (2008):

\[(18) \text{*Do you like } \underline{\text{what}}?\]

In (18), the object $wh$-phrase ($\text{what}$) merges from the base position to the right edge of CP. Under the Phase Theory in Chomsky (2008), the reason for this ungrammaticality should be ascribed to the PF problem; the sentence-final $wh$-phrase ($\text{what}$) moves rightward in violation of LCA in Kayne (1994), as shown in 2.1. This LCA-based account, however, still seems to be problematic, in that it cannot explain the specific reason for the ungrammaticality in (19):

\[(19) \text{*Of this article } [\text{a review } \underline{\_}] \text{ came out yesterday.}\]

In (19), the sentence-initial PP ($\text{of this article}$) is extraposed from the subject ($\text{a review}$), triggering its ungrammaticality. This leftward IM is in line

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6 Generally, definite DPs are not regarded as a candidate of QR. For instance, the definite object in (1a) does not induce Weak Crossover effect, in contrast to the universal quantifier in (1b):

(i) a. Her mother loves [the girl that Sue dislikes].
   b. *His mother loves [every boy].

See also Tanaka (2005) for other empirical problems of Fox and Nissenbaum (1999).
with the notion of LCA, and PP itself can be preposed to the sentence-initial position in English. Thus, without some sort of alternative mechanisms, (19) would wrongly be expected to be grammatical, contrary to fact. Given this, Chomsky (2004, 2008) claims that ExNPs are derived phonologically, unlike Kayne (1994) and Fox and Nissenbaum (1999). In this approach, extraposed elements emerge as ‘afterthought’ expressions, followed by the phonological deletion, which is shown in (20b) for (20a):

(20) a. We saw [a painting __] yesterday from the museum.

b. We saw [a painting] yesterday, (that is) a painting (one) [from the museum]

In (20b), a DP composed of the head DP (a painting) and the modifying PP (from the museum) originally appears in the sentence-final position as an afterthought expression and then undergoes the phonological deletion of the head DP, leaving only the PP which corresponds to the extraposed PP in (20a). This approach, however, cannot offer adequate syntactic configuration that distinguishes the grammatical contrasts with regard to the Condition C and PG licensing, as repeated below:

(21) a. /*I gave him [a picture __] yesterday of John’s mother.

b. I gave him [a picture __] yesterday from John’s collection.

(= (6a))

(= (6b))

Chomsky’s analysis would predict (i) as grammatical contrary to fact, because (i) involves no ill-formed deletion. In this respect, Chomsky’s analysis cannot be sustained.
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(22) a. I read [a book __] [before reading an article pg] about John.

b. *I read [a book __] [before reading an article pg] from John’s library.

These contrasts strongly suggest that ExNPs should be derived syntactically, but not phonologically. Thus, the structure-building assumption (17), which respects symmetry for merger operations, should be reconsidered, and then the directionality of the merger should be controlled by some syntactic mechanisms.

With the theoretical background of syntactic merger and its application in mind, we first argue that one of the basic tenets of the merger is the same as the assumption in Chomsky (2008): it takes two syntactic objects X and Y, and forms a new syntactic object Z={X,Y}. Moreover, we follow the basic notion of structure-building in Phase Theory that the merger is mediated by EFs.9 As mentioned earlier in this paper, Chomsky (2008) argues that EFs permit free merger to the edge to yield a new syntactic object. With these assumptions in mind, we partly depart from Chomsky’s (2008) Phase Theory and return to Chomsky (2000, 2001), and claim that not only phase heads but also merged elements in some cases of A′-merger contain AFs. In fact, Chomsky (2000: 128) suggests that wh-phrases have uninterpretable [wh]. Likewise, Bošković (2007) argues that under the Activation Condition, which is originally proposed as a condition of the Agree operation in Chomsky (2001), successive-cyclic mergers are driven by uninterpretable features (uFs) in merged elements, where the driving force of the syntactic operations is always provided for phase heads and merged elements.

With this in mind, we argue in this paper that featural contents of merged

9 EF proposed by Chomsky (2007, 2008) has several properties: EF is a property of a lexical item (LI) (Chomsky (2008: 139)), EF is undeletable from LI (Chomsky (2007: 11)), and EF (unlike phi-features) does not involve feature-matching (Chomsky (2008: 161, fn. 49)). Essentially, EF functions in two ways in Chomsky’s Phase Theory: one is to satisfy the basic selectional properties of LIs, and the other is to drive optional syntactic operations just like EPP in Chomsky (2000, 2001). Chomsky (2000: 109) argues that the EPP may be assigned to the phase head, conforming to the condition in (i) in cases where it is optional:

(i) Optional operations can apply only if they have an effect on outcome.

(Chomsky (2001: 34))

Thus, we focus on the latter function of EF in this paper. We thank an anonymous reviewer for clarifying this point.
elements affect the merger directionality and propose (23) as a formal mechanism that regulates the directionality of syntactic mergers.

(23) AFs in merged elements drive leftward syntactic mergers.

In (23), if an object (X) contains AFs and is merged to another syntactic object (Y), then X precedes Y. On the other hand, if X does not contain it and merges to Y, then X follows Y. That is to say, our supplementary mechanism in (23) assumes that the merger is essentially an asymmetric operation which is sensitive to the featural contents of merged elements. The central notion behind this mechanism lies in Saito and Fukui (1998). This study claims that, according to the traditional Head Parameter, elements move leftward in English if they involve uFs, whereas they move rightward if they do not. Our analysis based on (23), although framed in the Phase Theory, adopts the essence of Saito and Fukui (1998), in that extraposed elements in ExNPs, in which AFs/uFs are not involved, are derived by the rightward merger. With (23), the sentences in (18) and (19) are correctly excluded, since the wh-phrase (what) in (18) is supposed to have AF while the PP (of this article) in (19) is not.

3.2. EF-inheritance by the Interpretive Requirement

As mentioned in the introduction of this paper, Chomsky’s argument for Feature Inheritance is conceptually motivated, since it helps to minimize syntactic derivation, by relegating all grammatical functions to phase heads. On this matter, Richards (2007) presents a convincing argument. First, he argues that the valuation of uFs in the syntactic derivation and Transfer to the interfaces should occur simultaneously, as in (24):¹⁰

(24) Value and Transfer of uFs must happen together.

(Richards (2007: 566))

Richards argues that (24) is justified under the principle of the Full Interpretation (FI), which imposes on every syntactic derivation a formal restriction necessary for legitimate semantic/phonological interpretation at subsequent SM/C-I interfaces. Specifically, FI requires all uFs to be properly valued in the derivation and then soon to be transferred to the interfaces to be de-

¹⁰ This assumption might bring us back to the “long-standing problem about crash at the lower phase levels in successive-cyclic movement” (Chomsky (2008: 151)), as an anonymous reviewer pointed out. We believe that some feature-split mechanisms, by which the copy in the lower phase level does not contain the uninterpretable A’-feature, can be conceived to save the problem. For related analysis, see Obata and Epstein (2011). We leave the detailed account of this matter for future study.
leted; otherwise, it triggers a derivational crash at the interfaces, because the syntactic computation cannot distinguish the valued uFs from interpretable features at the time of the application of Transfer if uFs on phase heads still continue to stay in position. Since the complement domain selected by phase heads is included in the transferred domain, but the phase head itself is excluded from the domain, as shown in (25), the requirement in (24) enforces the uF on the phase head to discharge to its selecting head, as in (26):

(25) The edge and nonedge (complement) of a phase are transferred separately. (Richards (2007: 568))
(26) uF must spread from edge to nonedge (i.e. from C to T, v* to V, etc.). (Richards (2007: 569))

Due to (26), the uF can be valued in a single transferred domain, as in (27):

Thus, Richards (2007) claims that the uF-inheritance is driven by the simultaneous valuation and Transfer requirement under the principle of FI. With this theoretical justification made by Richards (2007) in mind, we will pursue the availability of the EF-inheritance from the interpretive demand.

First of all, note that there is a modification relation between extraposed elements and their host DPs, as shown in the standard ExNP paradigms below:

(28) a. [A review ___] came out yesterday of this article. (= (3b))
    b. [A man ___] appeared with green eyes. (= (5a))

Next, in the framework of Phase Theory, successive-cyclic Transfer is necessarily applied to the complement of phase heads. Moreover, we assume that a single transferred domain corresponds to the unit for the relevant semantic interpretation at the subsequent C-I interface in the derivational framework of the grammar. As a result, these considerations can lead us to the following assumption:

(29) The modification interpretation is formed within a single transferred domain.

According to (29), in ExNPs where both extraposed elements and their host DPs discontinuously appear in the syntactic configuration, they are re-
quired to stay in a same transferred domain for the modification interpretation. Let us observe the derivation of (28a) in light of (29):

(30) \[
\text{CP [CP C[EF] [TP [Subj a review \_ \_ ] \_ \_ ] [of this article]]}
\]

In (30), EF on C drives the extraposition of PP \textit{(of this article)} to the rightward CP. The derived position of the PP, however, is not included in the transferred TP in which the subject DP as its host is included, and hence the modification relation between them cannot be established in the domain. In order to avoid this, we will adopt the assumption in (31), so that EF in C can descend to T:

(31) Feature Inheritance is available for EF, as well as AF.  

11 Basically, the modification interpretation requires a local relation for both modifier and its target. On this matter, the positional difference between S(entential)-Adv(erb)s and VP-Adv is significant. For instance, S-Adv \textit{(frankly)} can appear in the sentence-initial position, as shown in (i), but VP-Adv \textit{(slowly)} cannot occupy the position but appear between the auxiliary and main V, as in (ii):

(i) a. \textbf{Frankly}, John may be telling a lie.
   b. *John may be \textbf{frankly} telling a lie.

(ii) a. *\textbf{Slowly}, Mary could move her injured arm.
   b. Mary could \textbf{slowly} move her injured arm.

These contrasts clearly show that adverbs should be attached to their modifying targets in a local configuration. This fact can be captured under our current phase-based analysis if the relevant adverbs should be adjoined to the relevant projections in a single transferred domain (cf. Chomsky (2004)). Given this, the S-Advs in (i), which modify the whole sentence, are to be merged to CP/TP, whereas the VP-Advs in (ii), which modify the predicate, are to be attached to vP/VP.

12 The EF-inheritance is an optional operation, unlike the AF-inheritance. The difference of the optionality between them is based on their formal requirement. AF-inheritance is an obligatory operation, which is necessarily followed by the Case/phi-agreement between T/V and subject/object DPs. On the other hand, it can be assumed that EF-inheritance is an optional operation. In fact, it is not necessary when a single modification domain formed in ExNPs directly corresponds to a single transferred domain. In this regard, matrix C sometimes does not transmit its EF to T if the configurational requirement between the relevant elements is satisfied. For instance, in the clausal extraposition from the \textit{wh}-phrase in the matrix Spec-CP, as shown in (i), the EF-inheritance need not occur, since the matrix CP directly corresponds to a default Transfer domain:

(i) \[
\text{[What secret document \_ \_], did the British government announce they were about to reveal \_ \_ last week that would change our view of history?}
\]  
(Takonai and Adachi (2005: 14))

The grammaticality in (i) indicates that CP can be an attachment site for the extraposed element.

For the attachment candidate of the extraposed element, DP/PP may also be the case, as well as CP/TP/vP/vP. For example, in the non-extraposed paradigm in (ii), the adjunct PP in the subject DP attaches its right edge due to the EF on D:

(ii) \[
\text{[A man \textbf{with green eyes} \_ \_ ] appeared.}
\]
As a result, (31) enables both the extraposed element and its host DP to fall into a single transferred domain, as below:

(32)

\[
\begin{array}{c}
\text{CP} \\
\text{Transfer}
\end{array}
\]

\[
\begin{array}{c}
\text{C} \\
\text{TP}
\end{array}
\]

\[
\begin{array}{c}
\text{TP} \\
\text{[of this article]}
\end{array}
\]

\[
\begin{array}{c}
\text{TP} \\
\text{[a review ___]}
\end{array}
\]

\[
\begin{array}{c}
\text{T'}
\end{array}
\]

In (32), EF, which is given to T from C, drives the PP extraposition to TP, resulting in a legitimate configuration for the interpretation, in that both extraposed PP and its host DP can coexist within the TP. Therefore, they are transferred to be derivationally assigned the relevant interpretation at the subsequent C-I interface.\(^{13}\)

Before concluding this section, we mention the structure-building operation for ExNPs as adjunction. The theoretical motivation behind this lies in the featural property of merged elements, as proposed in Saito and Fukui (1998) and Stepanov (2001). These studies show that whereas mergers engaged in the agreement constitute substitution into the specifier, the ones without it adjoin to the relevant maximal projections. This can fit into our approach, since the motivation for ExNPs proposed here only involves EFs.

3.3. The Phase-based Analysis of ExNPs
3.3.1. Syntactic Derivations of ExSubjs

In line with the assumptions proposed in previous sections, we can now proceed to offer an explanation of the syntactic derivation of ExNPs.\(^{14}\)

On the other hand, it is controversial whether PP is a phase, and therefore we do not address this matter in this paper.

\(^{13}\) An anonymous reviewer asked why the relevant modification relation is established in the derived positions, and not in the base positions. We argue that this is related to the semantic status of the latter copy, that is, the A-copy of the subject/object DP in the base position. Generally, A-copies, unlike A’-copies, do not have semantic content, as suggested by Chomsky (1995). For recent analysis of A-copies, see Takahashi and Hulsey (2009) and Lebeaux (2009).

\(^{14}\) Our phase-based analysis in this paper can be extended to the Heavy NP Shift (HNPS) construction, as shown in (i):

(i) John bought ___ for his mother a painting that he liked.
First, we will demonstrate the derivation of ExSubjs under our approach. The relevant examples are repeated as (33):

(33) a. [A review ___] came out yesterday of this article. (= (3b))
    b. [A man ___] appeared with green eyes. (= (5a))

A salient difference between these examples consists in the syntactic status of the extraposed PP: the former is a complement and the latter an adjunct. Generally, it has been argued that complements are located in a local position with the relevant heads (V/N) for their thematic requirement, while adjuncts are not. In the framework of Phase Theory, this thematic difference between them can be directly reflected in terms of two types of syntactic mergers: IM and EM. Given this merger dichotomy, it follows that the complement extraposition in (33a) is derived through IM, and the adjunct extraposition in (33b), through EM. Moreover, the two types of merger can be applied to the clausal extraposition, as shown below:

(34) a. [A claim ___] was made by John that the rain was causing the accident.
    b. [A book ___] appeared which was written by Chomsky.

In an appositive clause such as (34a), the extraposition is formed by IM. On the other hand, in a standard relative clause as in (34b), it is mediated by EM.

Before moving on to demonstrate the derivation of ExSubjs under our analysis, we should mention the predicate restriction on ExSubjs. Generally, it has been argued that ExSubjs can occur in the case of an unaccusative/passive subject, as shown in (33)–(35):

(35) a. [A man ___] was called with blond hair.
    b. [A book ___] was published by Updike. (Hirata (1996: 94))

On the other hand, ExSubjs cannot occur in the case of the transitive subject, as in (36): 15

With the hybrid A-/A′-property of the rightward DP (cf. Nishikawa (1990), Nishihara (1997)) in mind, our approach analyzes (i) as simultaneous A-/A′-mergers of the HNP to the relevant attachment site, as shown in (iia). After these mergers, two A-copies in the VP complement and Spec-VP become invisible due to their A-status, leaving A′-copy in the sentence-final position, as in (iib):

(ii) a. … [vP v* [EF] [vP HNP [v V [AF] HNP ]] HNP ]

b. … [vP v* [EF] [vP HNP [v V [AF] HNP ]] HNP ]

15 The grammatical status of the extraposed PP in (36) is a complement. Therefore, they are derived by the IM from the subject DP. For the grammaticality in the case of the adjunct ExNP in the transitive subject, see the discussion in 4.3.
On Extraposition from NP Constructions

(36) a. *[A new book ___] has attracted many people about the origin of human language. (Nakajima (1995: 21))
   b. *[A review ___] attracted many people of Chomsky’s book.

In the current phase-based approach, the grammaticality in (33)–(36) is ascribed to syntactic reasons. To look closely at the internal structure of these paradigms, unaccusative/passive predicates as in (33)–(35) involve a non-phasal vP and the derived subject which originally appear in V’s complement. By contrast, in the transitive predicates as in (36), subjects occupy the specifier of a phasal v*P as its underlying position. With this structural difference in mind, let us see the A’-extraction account by Chomsky (2008: 147–148). According to this account, A’-extractions are banned from a particular syntactic derivation when the upper phase head internally accesses to the elements in the lower phase edge, due to a locality condition. This is exemplified by the following contrast:

(37) a. Of which car was [the (driver, picture) ___] awarded a prize?
   b. *Of which car did [the (driver, picture) ___] cause a scandal? (Chomsky (2008: 147))

(37a) contains a passive predicate, where the subject originates from V’s complement, and in Chomsky’s account, the syntactic access from C to wh-phrase (of which car) is possible. On the other hand, (37b) has a transitive predicate where the original subject position is Spec-v*P, and then C’s access to the inside is not allowed.

This phase-based account can be straightforwardly applied to (36), where the subject starts from Spec-v*P in the transitive predicate. Thus, we can say that C cannot access the inside of this subject due to reasons of locality, as with (37b).

To bring the discussion back to the main topic, let us investigate the derivation of complement ExSubjs ((33a) and (34a)) under our approach:

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16 Chomsky (2008: 147–148) notes, “… the external argument itself can be accessed in the next higher phase, but there is a cost to extracting something embedded in it …”

17 In terms of the EF-inheritance mechanism, we can paraphrase the phase-theoretic account for subject extraction proposed by Chomsky (2008) as follows:

(i) EF which motivates A’-merger cannot access the inside of the lower phase edge.
First, C transmits its EF and AF to T in (38a). Next, these features access the subject in V’s complement and then drive two kinds of IM at the same time, as represented in (38b): the A-merger of the subject to the Spec-TP and the A’-merger of the extraposed element to the right edge of TP. Finally, TP is transferred, and then the modification relation is formed in the domain along the way to C-I interface, as in (38c).

Next, we will give the derivation of adjunct ExSubjs ((33b), (34b) and (35)), as in (39):

In this case, the extraposed element directly merges with TP via EM due to the EF which is transmitted from C to T, as in (39b). Then, this TP is transferred to the C-I interface for the relevant interpretation, as in (39c). Thus, our approach can successfully deal with the derivation of both complement and adjunct ExSubjs in a phase-based analysis.

3.3.2. Syntactic Derivations of ExObjs

Now we will show that our analysis can explain the relevant examples including PP extraposition and clausal extraposition shown in (40) and (41):

(40) a. John read [a paper □] over the summer of Chomsky’s.

(= (4b))

b. John read [a book □] over the summer by Chomsky.

(= (5b))

(41) a. I heard [a report □] two days ago that the rain caused an accident.

b. I called [somebody □] yesterday who I couldn’t stand.

Here, we will propose that the two derivational processes for complement and adjunct ExSubjs, which we observed in 3.3.1, similarly hold true for ExObjs. Namely, ExObjs also have two kinds of derivations, as illustrated
in (42) and (43):

(42) a. \[ v^* P \ [ V \ [ E F / A F ] \ [ O b j \ D P \ E x ] ] \]

b. \[ v^* P \ [ V \ [ D P \ [ V \ [ E F / A F ] \ [ O b j \ D P ] ] ] \ E x ] ] \]

c. \[ v^* P \ [ V \ [ D P \ [ V \ [ O b j \ D P ] ] ] \ E x ] ] \]

(43) a. \[ v^* P \ [ V \ [ E F / A F ] \ [ O b j \ D P ] ] \]

b. \[ v^* P \ [ V \ [ D P \ [ V \ [ E F / A F ] \ [ O b j \ D P ] ] ] \ E x ] ] \]

c. \[ v^* P \ [ V \ [ D P \ [ V \ [ O b j \ D P ] ] ] \ E x ] ] \]

The only difference from the cases of ExSubjs is the kind of the phase head: \( v^* \) in this case. It then follows that EFs are transmitted from \( v^* \) to V, and then the extraposed element is attached to the right edge of VP, via IM in the complement extraposition in (42b) and EM in the adjunct case in (43b). Consequently, the relevant elements fall within the VP as a single transferred domain, in which the modification formation is formulated at the subsequent C-I interface. Thus, our analysis can incorporate the syntactic derivation of ExObjs, in the same manner of ExSubjs shown in the preceding section.

3.3.3. EF Spreading

As a final remark on the syntactic derivations of ExNPs under our approach, we consider further derivational possibilities for ExSubjs in this section. Note that the transferred domain for unaccusative/passive predicates available for ExSubjs is wider than the one for other predicates. Specifically, we can add vP/VP to their attachment site, as well as TP shown in 3.3.1. According to Chomsky (2008: 157), C can transmit its EF not only to the head selected as its complement (T) but also the one dominated by it (v/V) in the same transferred domain. This mechanism can be termed EF Spreading and schematized as below:

---

18 Apart from the discussion in the paper, our EF Spreading might explain the derivation of the antecedent-contained deletion (ACD) in passive/unaccusative predicates shown below:
This enables phase heads to pass down EFs to the structurally lower heads (Y/Z in (44)), as well as to directly selected heads (X in (44)). This means that if some sort of configurational requirement becomes necessary for the derivation of ExSubjs, not only T but also v/V can be the target for the optional EF-inheritance from C. 19

4. Grammatical Properties of ExNPs

4.1. Complement/Adjunct Asymmetry

As mentioned in the introduction, the grammaticality of ExSubjs crucially depends on the syntactic status of extraposed elements, as repeated below:

(45)  a. */I gave himi [a picture ___] yesterday of John’si mother.

(= (6a))

b. I gave himi [a picture ___] yesterday from John’si collection.

(= (6b)) (Fox and Nissenbaum (1999: 8–10))


(= (7a))

b. *I read [a book ___] [before reading an article pg] from John’s library. (Fox and Nissenbaum (1999: 8–10))

A similar contrast is also seen in clausal extraposition, as below:

(47)  a. *I gave himi [an argument ___] yesterday that this sentence supports John’si theory.

b. I gave himi [an argument ___] yesterday that supports John’si theory. (Fox and Nissenbaum (1999: 7–10))

(i)  a. Mary wasn’t [vp introduced John to [dp anyone you were [vp e]]].

b. The road didn’t [vp go by [dp any of the scenic spots you expected it to [vp e]]] (Legate (2003: 509–510))

In (i), the boldfaced DP must go out of the VP in order for the deleted VP in it to be formally licensed for subsequent interface requirement, but the distance cannot be higher than vP/VP since NPIs contained in the DP should be c-commanded by negation (n’t). In this case, C sends its EF all the way to v/V to drive the DP movement due to the EF Spreading, leading (i) to be grammatical.

19 Our EF Spreading may also be applied to the extraposition of ECM/raising subject. In this case, matrix v* spreads its EF to the embedded T, surpassing the matrix V, since no phasal C intervenes between the matrix and embedded clause.
(48) a. I presented [an argument \[_\] \[before having evidence \(pg\)]\[\text{that what you told me is right.}\]
b. *I presented [an argument \[_\] \[before having evidence \(pg\)]\[\text{that you told me about.}\]

(Fox and Nissenbaum (1999: 7–10))

Before embarking on to explain these contrasts in our phase-based analysis, we should clarify the syntactic configuration in the double object (DO) construction as in (45) and (47). Suppose here that its verbal structure is like (49), as proposed by Takano (1998):\(^{20}\)

\[
(49) \ldots [\text{vP } \text{DP}_{\text{Subj}} [v' v [\text{vP } \text{IO } [v' v [\text{vP } \text{V } \text{DO } ]]]]]
\]

Takano (1998) adopts the layered vP structure for the DO construction, and assumes that the lower vP takes an indirect object (IO) in its specifier and lexical VP takes DO in its complement. Here, suppose that the upper vP corresponds to a phase.\(^{21}\) Given this, the upper v can send its EF to the lower v. This EF-inheritance enables the extraposed element to attach rightward with the lower vP, in terms of IM/EM, so that the modification relation between the extraposed element and its original host DP is formed in the same transferred domain (lower vP in this case).

With this in mind, let us consider the Condition C asymmetry, as repeated below:

(50) a. *I sent her [many gifts that Mary didn’t like] last year.

\((= (11a))\)

b. I sent her [many gifts ___] last year that Mary didn’t like.

\((= (11b))\) \quad \text{(Culicover and Rochemont (1990: 29))}

It is argued in our analysis that in (50a) without the ExNP, the relative clause externally merges with DO (\textit{many gifts}) located in the VP complement. This position is asymmetrically c-commanded by the IO (\textit{her}), resulting in a Condition C violation. In contrast to this, in (50b) with the ExNP, the extraposed relative directly merges rightward to the lower vP due to the EF transmitted by the upper v. In this position, the R-expression in the relative successfully circumvents the c-commanding domain of the IO (\textit{her}). Therefore, well-formedness is achieved in (50b).

To return to the main discussion in this section, our phase-based analysis, together with the configuration for the DO construction in Takano

\(^{20}\) In (49), the main verb eventually moves up to the upper v, via the lower v, based on the standard assumption for the verbal derivation.

\(^{21}\) The phasality on vP is attributed to the agentive property of the subject DP.
(1998), can arrive at the same conclusion as Fox and Nissenbaum (1999), as shown in 2.2. First, our approach assumes that the complement extraposition is sentence-internally merged from the DP to the derived VP, leaving its copy in the DP. This can affect the binding sensitivity in (45a) and (47a). Moreover, if we assume this IM is categorized as an A′-merger, the PG can be licensed by the IM, as in (46a) and (48a). On the other hand, the adjunct extraposition is derived via the EM. Therefore, this does not leave the copy of the extraposed element in the host DP, hence avoiding the binding violation, as in (45b) and (47b). At the same time, this EM cannot license the PG, resulting in the ungrammaticality in (46b) and (48b).

Furthermore, our approach can be applied to another complement/adjunct asymmetry for ExNPs, with regard to the Definiteness Effect, which is shown below:

(51) a. I saw [a (very good) picture ___] yesterday of the museum.
    b.??I saw [the (best) picture ___] yesterday of the museum.
    (= (16a))
    c. I saw [the (best) picture ___] yesterday from the museum.
    (Fox and Nissenbaum (1999: 8))

(52) a. I heard [a similar rumor ___] yesterday that you were quitting.
    b.??I heard [the same rumor ___] yesterday that you were quitting.
    (= (16b))
    c. I heard [the same rumor ___] yesterday that you were spreading.
    (Fox and Nissenbaum (1999: 8))

(a) and (b)-sentences involve the complement extraposition, whereas (c)-sentences involve adjunct extraposition. The important contrasts related to the current discussion are the (b) and (c)-sentences. First, in the ungrammatical (b)-examples, these extrapositions occur from the definite DPs, hence inevitably resulting in the Definiteness Effect. On the other hand, in the grammatical (c)-examples, these extrapositions can successfully evade the effect, since they are derived by EMs. Thus, our current analysis can deal with various complement/adjunct asymmetries with regard to ExNPs.

4.2. NPI Licensing

Several studies (cf. Guéron (1980), Hirata (1996), Mizuguchi (2009)) have shown that extraposition affects the grammaticality concerning NPI licensing, as in (53):

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In this section, we will show that our approach can adequately explain this grammatical difference. First, we presume the standard syntactic structure of negative sentences, in which negative elements like not appear between TP and vP, and the licensing requirement of NPIs, in which they must be c-commanded by the negative elements. Under these assumptions, in (53a) where the extraposition does not occur, the NPI must stay within the subject DP in Spec-TP. This position is not c-commanded by not, which leads to the ungrammaticality. On the other hand, in the extraposed (53b), our approach can allow extraposed elements to be attached to TP/vP/VP due to the EF Spreading. Among these candidates, TP cannot satisfy its licensing requirement, but vP/VP surely can. Thus, the well-formedness in (53b) results from the derivation that the extraposed elements attach to the either projection where the NPI can be c-commanded and then properly licensed by not.

4.3. The Grammaticality of ExSubjs

As already shown in 3.3.1, the application of the extraposition is not allowed for the transitive subject, as repeated in (54):

(54) a. *[A new book ___] has attracted many people about the origin of human language. (= (36a)) (Nakajima (1995: 21))
   b. *[A review ___] attracted many people of Chomsky’s book. (= (36b))

Under the phase-based account in Chomsky (2008), this is explained by the assumption that the upper phase head cannot access the inside of the elements located in the lower phase edge. Namely, in (54), C cannot access the inside of the subject DP located in Spec-v*P. This explanation, however, cannot accommodate the ungrammaticality of (55) which is derived by the EM of the adjunct PP.

(55) *[A man ___] hit Mary with hostility toward her. (Nakajima (1995: 21))

However, the adjunct extraposition from the transitive subject becomes possible, given a suitable context for a focus interpretation of the extraposed element. For instance, it becomes fully grammatical in a coordinated context as shown in (56):
(56) A man with blue eyes hit Jane, and then [a man __] kissed Mary with green eyes.

Therefore, we will claim that the adjunct extraposition from the transitive subject is basically grammatical in our framework, and the degradation in (55) is attributed to some other factors. In fact, as shown in (57), the relative clause extraposition from the transitive subject is fully grammatical:22

(57) a. [A man __] hit Mary who had hostility toward her.
    b. [A new book __] has attracted many people which is concerned with the origin of human language.

(Nakajima (1995: 21))

The contrast between (55) and (57) implies that the grammaticality of adjunct ExSubjs is also affected by the categorical status of the extraposed element: the adjunct ExSubj in the ungrammatical (55) is a PP, while the one in the grammatical (57) is a CP. The most striking difference between them is the existence/absence of the gap in the extraposed element, which corresponds to their antecedent.23 We assume that this difference plays a crucial role in forming a modification relation between the extraposed element and the host DP. Specifically, the extraposed PP in (55) has no gap which can function as a linking marker for the interpretation, and then it may be a potential factor that makes us confuse the sentence-final PP as either the extraposed element or the simple adverbial PP. On the other hand, (57) obviously has the antecedent’s gap which can contribute to the identification of the construction.24 That is to say, the relative clause extraposition is more formally identifiable than the PP extraposition, and this affects the

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22 Two of our informants (one American and one British) judge (55) as acceptable and (57) as perfect.
23 Similar remarks are observed in Nakajima (1995).
24 As a related matter, as an anonymous reviewer pointed out, we should mention an important difference between the completely grammatical PP extraposition shown in (i) and ungrammatical (55):

(i) a. [A review __] came out yesterday of this article. (= (3b))
    b. [A man __] appeared with green eyes. (= (5a))

In the complement ExSubj in the unaccusative predicate shown in (ia), the subject contains the gap for the extraposed PP, which can be a linking marker of the modification interpretation. Therefore, the existence/absence of the relevant gap affects the contrasting grammaticality in (ia) and (55). This account seems not to be applied to the adjunct ExSubj in the unaccusative predicate in (ib), in which the subject has no gap of the extraposed PP. This example, however, can be interpretively more identifiable than (55), since the former includes only one argument DP (a man) while the latter has two arguments (a man and Mary). It then means that in (55), the speaker may confuse the modification relation between the PP and the two arguments, and possibly interpret it as a
well-formedness in (57).

4.4. Attachment Sites

As was shown in Culicover and Rochemont (1990, 1994) and Rochemont (1992), there is a clear structural difference between ExSubjs and ExObjs with regard to attachment sites. First, let us investigate the former. We repeat the relevant paradigms as (58):

(58) a. [A MAN__] came in with blond hair, and [a WOMAN__] did [VP e] TOO. (= (10a))

b. [A MAN__] came in with blond hair, and [a WOMAN__] did [VP e] with BROWN hair. (= (10b))

(Culicover and Rochemont (1990: 30))

In these ExSubjs including VP ellipsis in the second conjunct, extraposed elements may but need not be confined in VP. As shown in 3.3.3, our analysis ensures TP/vP/VP as an attachment site for ExSubjs. Given this, in (58a) where the extraposed element is included in the deletion site, it merges with vP/VP, while in (58b) where that is outside the site, it merges with TP.

In contrast, the attachment site of ExObjs is more restricted:

(59) a. John said he would meet [a man__] at the party (who was) from Philadelphia, and [meet [a man__] at the party (who was) from Philadelphia] he did.

b. *John said he would meet [a man__] at the party (who was) from Philadelphia, and [meet [a man__] at the party] he did (who was) from Philadelphia.

(Culicover and Rochemont (1990: 30))

(60) a. What John did was draw [a picture__] on the wall of his brother.

b. *What John did of his brother was draw [a picture__] on the wall.

(Culicover and Rochemont (1990: 30))

The pairs in VP Preposing in (59) and Pseudoclefting in (60) prove that the relevant extraposed element must be included in v*P. These facts are consistent with our approach, in which ExObjs are attached to VP by V’s EF which is transmitted by v*.

The ungrammaticality in (i) also supports that the attachment site of ExObjs is restricted to the VP domain:
Moreover, given the structural difference between ExSubjs and ExObjs shown above and the standard point of view of linearization in generative grammar, where hierarchically higher syntactic objects are located in the sentence-edge, then it is expected that if both extrapositions coexist in a single sentence, the word order would be fixed. This prediction can be verified in Multiple Extraposition constructions such as (61), in which more than one extraposition occurs in a single sentence:

\begin{itemize}
  \item[(61)]
  \begin{enumerate}
    \item[A man \_\_] entered [the room \_\_] last night [that I had just finished painting], [who had blond hair].
    \item *[A man \_\_] entered [the room \_\_] last night [who had blond hair], [that I had just finished painting].
  \end{enumerate}
\end{itemize}

(Culicover and Rochemont (1994: 2))

In (61), transitive ExSubjs follow ExObjs, and not vice versa. In our analysis, this contrast is directly ascribed to the attachment difference between ExSubjs in TP/v*P and ExObjs in VP. Given this, it could be said that (61a) constitutes a correct word order, while (61b) does not.

4.5. Clause Boundedness

According to Akmajian (1975), Ross (1986), and Culicover and Rochemont (1990), extraposed elements cannot raise to the upper clause across the finite clause boundary:

\begin{itemize}
  \item[(62)]
  \begin{enumerate}
    \item It was believed that John saw [a picture \_\_] in the newspaper of his brother by everyone.
    \item *[It was believed that John saw [a picture \_\_] in the newspaper by everyone of his brother.]
  \end{enumerate}
\end{itemize}

(Rochemont (1992: 375))

The contrast in (62) shows that the application domain for the extraposition is restricted to the clause in which the extraposed elements originally arise. However, this property is completely different from other A'-constructions. For instance, wh-phrases can easily cross over the finite clause boundary in the wh-question, as below:

\begin{itemize}
  \item[(63)]
  \begin{enumerate}
    \item Who do you think that John loves \_\_?
  \end{enumerate}
\end{itemize}

We will suggest that the contrasting A'-property between them is due to the modification requirement under our analysis. First, in the derivation

(i) *He, invited [several people \_\_] to the party who John, liked.

(Rochemont (1992: 376))

In this paradigm, the Condition C violation arises between the subject (he) in the Spec-TP and the R-expression (John) in the relative. This means that the attachment site of ExObjs must be lower than TP.
of ExNPs, the extraposed elements and their hosts are required to be in the same transferred domain for their modification relation. This entails that the extraposed element in ExObjs must be confined in the embedded VP as in (62a), and cannot raise to the matrix clause as in (62b). By contrast, in the wh-movement as in (63), the relevant interpretive configuration is not required. Therefore, the wh-phrase can move up successively to the upper clause in search of the agreeing C. 26

Using the current account for the clause boundedness in ExNPs, we now would like to draw attention to two cases related to the effect. The first one is (64) where the clausal extraposition occurs from a wh-phrase. This wh-phrase raises from the embedded to the matrix clause, and the application of the extraposition from inside the wh-phrase seemingly violates the boundedness: 27

\[
(64) \quad \text{[What secret document \_\_\_] did the British government announce they were about to reveal \_\_\_ last week that would change our view of history?} \quad \text{(Takonai and Adachi (2005: 14))}
\]

According to our analysis, the extraposed relative can be directly merged to the derived position by EM. This relative and wh-phrase can properly constitute a modification relation in the matrix CP where the default Transfer is finally applied. Thus, the grammaticality in (64) is ensured by the “pied-piping” effect so that the extraposition is seemingly accompanied by the wh-movement to the matrix clause.

Next, given that our analysis crucially relies on the existence of phase heads for the application of ExNPs, it is predicted that the relevant bound-

---

26 One reviewer questions whether our analysis can distinguish the grammaticality of a wh-question as in (i) and an ExNP as in (ii):

(i) *Of which car was [the (driver, picture) \_\_] awarded a prize?* (= (37a))
   (Chomsky (2008: 147))

(ii) *It was believed that John saw [a picture \_\_] in the newspaper by everyone of his brother.* (= (62b))
   (Rochemont (1992: 375))

This contrasting grammaticality also seems to be involved in the featural difference between moved elements in our framework. In the wh-movement in (i), the wh-phrase necessarily agrees with C in the derived position after the modification relation is formed in the base position, whereas in the ExNP, the extraposed element does not agree after the modification formation. Given this, the extraposed PP in (ii) undergoes further unnecessary IM to the matrix clause from the standpoint of the derivational economy, hence resulting in the ungrammaticality.

27 In (64), we have the interpretation that the temporal adverbial \textit{(last week)} modifies the matrix predicate \textit{(announce)}. This in turn means that the extraposition in this case must be located in the matrix clause.
edness is not observed in the raising infinitive, since it has no phasal CP in its embedded clause. This is evidenced by the grammaticality in (65) where the complement PP moves from the embedded clause to the most rightward position, surpassing the boundedness:

(65) \[A \textit{review }\underline{\textit{of this article}}, \text{ seemed to appear to be certain to come out }\underline{\textit{yesterday}}\]

(Mizuguchi (2009: 315))

In our analysis, the extraposition cannot be trapped in its embedded domain which has no phase head. Consequently, EF on T, which is transmitted from the matrix C, enables the PP (of this article) to be merged with matrix TP, and then to successfully bypass the boundedness.

5. Further Considerations

This section tries to extend the current analysis for ExNPs to the derivation of the Secondary Predicate (SP) construction. They can be divided into subject-oriented SPs (SSP) shown in (66a), and object-oriented SPs (OSP) shown in (66b). In each case, a sentence-final adjective modifies the relevant DPs in the sentence:

(66) a. \textit{John drove home happy}. (SSP)  
    b. \textit{Mary drank coffee hot}. (OSP) (Nakajima (1990: 276))

As in (66), SPs have a predicate as modifier and its target DP in the same sentence, and represent subject/object parallelism, as well as ExNPs. Given their interpretive and distributive similarities, we assume that the syntactic derivation of SPs and ExNPs is almost identical. Let us consider SSPs first. According to our approach, the derivation of (66a) can be illustrated in (67):

(67) a. \[\text{CP C }\text{TP }\underline{T} \text{[EF/AF]} \text{[\textit{v*P John v* [VP drove home]}]]}\]
    b. \[\text{CP C }\text{TP John [T} \text{T} \text{[EF/AF]} \text{[\textit{v*P }\underline{\textit{John v* [VP drove home]}]}]]}\]
    c. \[\text{CP C} \text{TP John [T} \text{T} \text{[\textit{v*P }\underline{\textit{John v* [VP ...]}]}] happy]}\]

In (67a), C transmits its EF and AF to T, after the first Transfer applied to the VP. Next, AF motivates the A-merger of the subject DP from Spec-v*P to Spec-TP, and at the same time, EF drives external A’-merger of SSPs to the rightward TP, as in (67b). This EF-inheritance results in the formation required for the modification relation between the SSP and its modifying DP.
in a single transferred domain, followed by the relevant interpretation at the C-I interface, as in (67c).

Next, we turn to consider the derivation of OSPs in (66b). If we take the derivational correlation between ExSubjs and SSPs into account, we expect the same derivation of OSPs as that of ExObjs:

\[
\begin{align*}
(68) & \quad a. \ [v^*P \ v^* \ [VP \ V(drank)_{EF/AF} \ coffee]] \\
& \quad b. \ [v^*P \ v^* \ [VP \ coffee \ [V^* V_{[EF/AF]} \ coffee]] \ hot] \\
& \quad c. \ [v^*P \ v^* \ [VP \ coffee \ [V_{EF/AF} \ coffee]] \ hot]
\end{align*}
\]

First, as in (68a), both AF and EF in \(v^*\) are passed to V. Next, both the internal A-merger of the object (coffee) driven by AF and the external A′-merger of the secondary predicate (hot) by EF occur at the same time, as in (68b). After these mergers, Transfer is applied to the VP domain where the modification formation can be established between the relevant elements, as in (68c).\(^{28}\)

To summarize the discussion so far, our phase-based approach can also be applied to the derivation of SPs. In what follows, we will show several empirical data supporting the legitimacy of our approach to SPs.

The first one is related to the distributional property of SSPs. Their attachment sites are not included in the VP-domain, as shown in the grammatical contrasts below:

\[
\begin{align*}
(69) & \quad a. \ John \ ate \ the \ meat \ quickly \ naked. \\
& \quad b. \ *John \ ate \ the \ meat \ naked \ quickly. \quad \text{(Nakajima (1990: 280))}
\end{align*}
\]

\[
\begin{align*}
(70) & \quad a. \ John \ hit \ the \ dog \ bitterly \ angry. \\
& \quad b. \ *John \ hit \ the \ dog \ angry \ bitterly. \quad \text{(Nakajima (1990: 280))}
\end{align*}
\]

These contrasts show that if manner adverbs such as quickly/bitterly modifying the actions represented the main verb in (69) and (70) belong to \(v^*P\), SSPs must be attached to higher projections than the adverbs. In our analysis, due to the EF in T, SSPs are adjoined to the right edge of TP. The

\(^{28}\) As shown in (67) and (68), our current approach assumes that the merger of the secondary predicates is mediated via adjunction. This assumption is supported by their adjunct-like status, shown below:

\[
\begin{align*}
(i) & \quad a. \ John \ drove \ home \ (happy). \quad \text{(SSP)} \\
& \quad b. \ Mary \ drank \ coffee \ (hot). \quad \text{(OSP)}
\end{align*}
\]
grammaticality of (69) and (70) is successfully captured by our analysis.29
In contrast to SSPs, the attachment site of OSPs is necessarily included in the VP, as shown in (71)–(73):

(71) **VP Preposing** (Roberts (1988: 705))
   a. John wanted to drink the beer flat—and \([v^*P \text{drink the beer flat}]\) he did.
   b. *John wanted to drink the beer flat—and \([v^*P \text{drink the beer}]\) he did flat.

(72) **Though Movement** (Roberts (1988: 705))
   a. \([v^*P \text{Drink the beer flat}]\) though John may.
   b. *\([v^*P \text{Drink the beer}]\) though John may flat.

(73) **Pseudoclefts**30
   a. What John did was \([v^*P \text{drink the beer flat}]\).
   b. *What John did flat was \([v^*P \text{drink the beer}]\).

In our analysis, it follows that OSPs attach with VP due to V’s EF, and they are confined in the v*P domain. Given this, in the grammatical examples as in (71a)–(73a), their attachment sites are involved in the domain, whereas in the ungrammatical examples as in (71b)–(73b) they are not.

Finally, our analysis can properly explain the grammaticality of complicated sentences which contain both SPs and ExNPs. The first case is concerned with SSPs, as in (74) and (75). In these paradigms, SSPs can appear in the left of ExSubjs, but not of ExObjs:

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29 There are several further paradigms that shows SSPs are outside VP-domain. First, Nakajima (1990) shows that some speakers judge VP-targeted phenomena shown in (i) to be acceptable:

(i) a. … \([v^*P \text{leave the room}]\) Bill did happy. (VP Preposing)
   b. John drove home drunk, and Bill did \([v^*P \text{e, sober}]\). (VP Ellipsis)
   
(Nakajima (1990: 286))

The next one is related to the attachment site for the sentential-final “heavy” DP:

(ii) *John left ___ angry [the awful party where everyone was drunk and rowdy].

(Nakajima (1990: 279))

In (ii), the heavy DP moves from the original position to its sentence-final position by the application of HNPS. According to Rochemont and Culicover (1990), the landing site for heavy DP is restricted to VP. Given this, the ungrammaticality in (ii) is ascribed to the attachment impossibility of SSPs.

30 I owe the judgment of (73) to my American informant.
(74) a. [Many people ___] came in angry [who were wearing funny hats].
   b. [A man ___] left happy [who had a plan to build a new house in the suburbs]. (SSPs/ExSubjs) (Nakajima (1990: 277))

(75) a. *John drove [a car ___] happy [which was presented to him by his parents].
   b. *Bill left [the party ___] angry [which my wife had prepared since last weekend]. (SSPs/ExObjs) (Nakajima (1990: 277))

As shown in the preceding sections, our analysis for ExNPs regulates their attachment sites as follows: TP/vP/VP for ExSubjs and VP for ExObjs. In (74), the attachment site of both SSPs and ExSubjs exactly ranges from TP to VP. The possible combinations include one in which SSPs occupy a lower position than ExSubjs: for instance, the former attaches to VP and the latter to TP. Therefore, the well-formedness in (74) is correctly captured by our analysis. In contrast, in (75), the attachment site for SSPs in the transitive predicate and ExObjs are totally different: the former is TP/v*P, while the latter is VP. Thus, the ungrammaticality in (75) is naturally explained by our analysis which predicts that SSPs should occupy the right position of ExObjs.

By contrast, in ExObjs, OSPs can appear to the left position of both ExSubjs and ExObjs, as evidenced by the grammaticality in (76) and (77) below:

(76) a. [Some people ___] drink milk fresh [who are health-conscious].
   b. [Many Americans ___] eat fish raw [who are interested in something Japanese]. (OSP/ExSubj) (Nakajima (1990: 277))

(77) a. John ate [the fish ___] raw [which he bought at Legal Seafoods].
   b. Bill bought [mares ___] young [which had been brought up in Texas]. (OSP/ExObj) (Nakajima (1990: 277))

In our approach, OSPs are severely restricted to the right edge of VP. This possibility is in accordance with the one in both the ExSubjs in the transitive predicate as in (76) (TP/v*P) and ExObj in (77) (VP), hence leading to their well-formedness.

31 If we assume a multiple adjunction strategy here, we expect another derivational possibility of the reverse order of ExSubj and SSP in (74), and ExObj and OSP in
6. Concluding Remarks

Thus far, we have investigated the syntactic derivation of ExNPs and SPs, and clarified their grammatical properties in our phase-based analysis. Specifically, we give two assumptions in (78) regarding the directionality of syntactic mergers and the EF-inheritance mechanism imposed by the modification requirement:

(78) a. The syntactic merger has no directionality restriction.
    b. The modification interpretation is formed within a single transferred domain.

In particular, (78a) is supplemented by another formal mechanism as in (79), which regulates the directionality of syntactic mergers in terms of the existence of AFs in merged elements:

(79) AFs in merged elements drive leftward syntactic mergers.

Due to (79), we can successfully derive the directional difference between leftward A′-mergers (wh-movements) and rightward A′-mergers (ExNPs/SPs).

Given these mechanisms, we have presented a general condition of the syntactic derivation of ExNPs and SPs in (80), which constrains the application of syntactic mergers in terms of a Transfer/modification domain:

(77). Contrary to expectations, however, the relevant grammaticality is severely degraded:

(i)  a. [Many people _] came in angry [who were wearing funny hats].  (= (74a))
     (Nakajima (1990: 277))
    b.??[Many people _] came in [who were wearing funny hats] angry.
     (SSP/ExSubj)

(ii) a. John ate [the fish _] yesterday raw [which he bought at Legal Seafoods].  (= (77a))
     (Nakajima (1990: 277))
    b.??John ate [the fish _] yesterday [which he bought at Legal Seafoods] raw.
     (OSP/ExObj)

The main reason for the degradedness of the (b)-examples is associated with a discourse factor. According to my informant, the modification relation cannot be well established in the (b)-examples, since the distance between SPs and subject/object DPs as their modifying target is too far, while this is not so for extraposed relatives and the relevant DPs. Under our analysis in 4.3, this interpretive contrast might be related to the existence/absence of the gap in the extraposed element, which corresponds to their antecedent: relative clauses have the relevant gap in the inside, while SPs do not. This then makes the speaker confuse their modification relation in the (b)-examples, leading to their degradation.

Another factor in the relevant examples may be related to the lexical heaviness of the sentence-final elements and their informative preference in the discourse context. For a related argument, see Kuno and Takami (2004).
Both extraposed elements/secondary predicates and DPs as their modifying target must be in a single transferred domain, so that the modification interpretation can be assigned to these lexical items at the subsequent C-I interface.

Based on (80), we have demonstrated that our analysis can derive the grammatical properties of a symmetrical derivation of the relevant rightward merger constructions, by considering phase-based mechanisms (C-T on ExSubjs/SSPs and v*-V on ExObjs/OSPs) and two types of syntactic merger (IM and EM).

To the extent that our analysis successfully accommodates the grammatical behaviors of rightward merger constructions like ExNPs/SPs, it can be concluded that the Phase Theory in Chomsky (2008) can be extended to clarify more phenomena than Chomsky’s original idea and contribute to explicate the grammatical mechanism of human beings.

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[received April 30 2011, revised and accepted September 1 2011]

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