

**Derivations of Nominal Expressions:
A Perspective from the nP Analysis**

by

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要旨

従来、名詞句の内部構造は決定詞 (determiner) を主要部 (head) とする決定詞句 (Determiner Phrase) であるとされてきた。この仮説を決定詞句仮説 (the DP hypothesis) と呼ぶ。しかしながら、名詞句はやはり名詞句であって、決定詞句ではないという Chomsky (2019a) の発言以来、決定詞句仮説の信憑性は揺らいでいる。ただし、Chomsky は自身の名詞句仮説の検証を本格的に行っておらず、この名詞句仮説がどの程度信頼に値するのか、いまだに定かではない。そこでこの論文では、Chomsky の名詞句仮説の信憑性が妥当であることを論証すべく、様々な角度から検証を行った。

この論文では、Chomsky (2013a, 2015a, 2020) で提唱された labelling algorithm (LA) の枠組みを用いて分析を行っている。この枠組みでは、併合 (Merge) によって導出された要素を句 (phrase) と呼び、併合によって導出されていない要素を語彙要素 (lexical item) と呼び区別している。Chomsky によると、語彙要素しか主要部 (head) として機能しないので、決定詞が主要部として機能するには、決定詞が語彙要素 (lexical item) である必要がある。

Leu (2015) の研究により、指示詞 (demonstrative) など、従来、決定詞句として扱われてきた要素が、実際は句であるということが判明した。これにより、Chomsky の名詞句仮説の妥当性がより一層強められた。ただし、a や the 等の冠詞類が句であるのか、lexical item であるのかは、意見の一致を見ない。Chomsky (2019a) は、冠詞類は名詞句の素性 (feature) であり、それが名詞句から分かれて発音されているに過ぎないと主張しているが、Leu (2015) や Oishi (2015) は、冠詞類も句であると主張している。この論文では、Leu と Oishi への反論を示すことで、Chomsky の説の妥当性を立証した。

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Derivations of Nominal Expressions:

A Perspective from the nP Analysis

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Abstract: The aim of the present thesis is to investigate internal structures of nominal phrases within the framework of labelling algorithm proposed in Chomsky (2013a, 2015a, 2020). By doing so, we consider the validity of the claim made by Chomsky (2007, 2019a) that a nominal phrase is not a determiner phrase, as assumed in the vast majority of the literature. He continues that the internal structure of a nominal phrase mirrors that of a verbal phrase, the validity of which claim is also evaluated in this paper.

Keywords: Labelling Algorithm, Problems of Projection: Extension (POP+), the nP hypothesis, nominal phrases

Chapter 1

Theoretical Background

1.1 Introduction

This thesis investigates internal structures of nominal expressions in light of recent developments in the generative field, namely the nP hypothesis proposed by Chomsky (2007) and further developed by Oishi (2015). In the current literature, the dominant idea holds that a nominal expression is headed by a determiner, hence a DP. This idea, first proposed by Abney (1987), is referred to as the DP hypothesis and widely accepted by scholars in the generative field. However, Chomsky (2007, 2013a, 2019a) and Chomsky et al. (2019) cast doubt on the

DP hypothesis, claiming that a nominal expression is in fact headed by a nominalizer (n), which corresponds to the verbalizer (v) in vP. If so, it follows that a nominal phrase is an nP, rather than a DP. The gist of their arguments is that the derivation of a nominal phrase corresponds to that of a verbal phrase. We refer to this recent analysis as the nP hypothesis and one of the aims of this thesis is to consider the validity of the nP hypothesis on both theoretical and empirical grounds.

To do so, this thesis first examines the derivations of both vP and nP within the framework of the labelling algorithm (LA) proposed by Chomsky (2013a, 2015a, 2020). Within this framework, the syntactic object constructed by merger receives its label in accordance with what the labelling algorithm returns (Chomsky 2013a, 2015a). In this framework, only a simplex lexical item or its features can serve as the label of a given syntactic object, meaning that a complex object constructed by merger is unable to serve as a label for a syntactic object (ibid.). In light of this supposition, Chapter 2 of the present paper evaluates somewhat contrasting analyses made by Leu (2015) and Chomsky (2019a). Leu (2015), investigating German, Swiss German, and several other languages such as Greek, concludes that a determiner is a morphologically complex element and what is called a determiner is in fact an adjectival phrase. If so, a determiner, being constructed by merger of smaller elements, cannot serve as a label of a nominal phrase (Chomsky et al. 2019). However, a question remains whether or not we can extend Leu's analysis to the English language, where determiners such as *the* and *a* seem to be lexical items. On the other hand, Chomsky (2019a) suggests in his UCLA lectures that

“in a nominal phrase, definite articles are actually features of the nominal phrase, not elements merged into it, very much like Semitic, where the definite article appears in every element of nominal phrase, including the determiner” (p.51).

If so, a definite determiner like *the* is not able to serve as a label of a nominal phrase, since it is just a feature on a nominal phrase, spelled out separately from the core nominal phrase. Furthermore, he continues that “[a]s far as determiners are concerned, like say *that*, I [i.e., Chomsky–H.T.] suspect that they are adjuncts” (Chomsky 2019a:51). Although within Chomsky's analysis the difference between an article and determiner is unclear, he seems to mean by “article” to refer to an item like *the*, whereas the term “determiner” seems to be employed to refer to items such as *this* and *that*, though all of these items are just referred to as determiners in the majority of the literature on the generative syntax. If so, as far as what

Chomsky calls determiner is concerned, Chomsky's analysis does not contradict Lue's finding, as phrasal items alone serve as adjuncts. In any event, it does not seem likely that a nominal is a determiner phrase, and as a consequence, the nP hypothesis emerges as an alternative approach to nominal constructions.

Furthermore, the nP analysis will shed new light on some linguistic phenomena the former DP hypothesis left unexplained. For instance, nominalization, stemming from Chomsky's remark in 1972, still has unsolved mysteries within the DP framework. The problem seems to be rooted in the DP analysis itself, which wrongly predicts that a nominalized phrase corresponds to a clausal expression (CP), rather than a verbal phrase (vP) (Alexiadou et al. 2007, Hiraiwa 2005, Lecarmae 2004¹ among others). The present work, following Chomsky's (2007) insight that nP corresponds to vP, explores an alternative approach to the nominalization. That is, the phenomena referred to as nominalizations are in fact v/n alternations with lexical roots unchanged (Marantz 1997).

The present paper is organized as follows: Chapter 1 considers theoretical backgrounds of the nominalizations and the DP hypothesis. Chapter 2 goes into details of labelling algorithm developed in Chomsky (2013a, 2015a, 2020), and then delves into issues as to how internal structures of both verbal and nominal phrases are analyzed in the current framework.

1.2 A Theoretical Background

1.2.1 Nominalization (Chomsky 1972)

Analysis of internal structures of nominal phrases has garnered much attention since the early days of the generative enterprise. For instance, cases like (1) and (2) below, referred to as nominalizations in the professional literature, have been well studied.

- (1) a. The enemy destroyed the city.
- b. The enemy's destruction of the city.

- (2) a. He has decided to study syntax.
- b. His decision to study syntax.

It seems that the examples in (1a) and (1b) have very similar meanings, though (1b) lacks an inherent tense property, and the same analysis also applies to the expressions in (2).

¹ Yuki Kawabata (p.c.) brings Lecarme (2004) to my mind.

Chomsky (1972), observing this point, argues that the nominal phrases in (1b) and (2b) are both nominalized forms of (1a) and (2a), respectively. More precisely, Chomsky (1972) supposes that the nominal phrases in (1b) and (2b) are generated by applying to their counterpart sentences in (1a) and (2a) the transformational operation called “nominalization”.

Nominalizations have some interesting properties. First, a single sentence might have more than one counterpart nominalized forms, as the below examples make clear.

(3) John refused/ has refused the offer.

(4) a. John’s refusing the offer.

b. John’s refusal of the offer.

c. John’s refusing of the offer. (Chomsky 1972: 60)

The sentence in (3) seems to have at least three nominalized counterparts shown in (4a-c).

The second interesting property of the nominalization is that the nominalized forms seem to lack inherent tense. For instance, one cannot tell whether (4a-c) refer to the present, past, or future. In fact, the nominalized forms can refer to any of these three kinds of tense depending on the contexts. Consider the below cases.

(5) a. John’s constant refusing of the offer always annoys Nancy.

b. John’s refusal of the offer upset Nancy.

c. There is a possibility of John’s refusing the offer.

Although some words were added to make the contexts clearer (e.g., *constant* in 5a), the examples in (5) make it clear that nominalized forms in (4) can refer to present, past and future, depending on the contexts in which they are placed. This point buttresses the hypothesis that nominalized forms like (4a-c) lack inherent tense, and this analysis, as we see in detail in Chapter 2, is crucial for the nP hypothesis. This is because the nP hypothesis is based on Chomsky (2007) and Chomsky et al.’s (2019) supposition that the internal structure of a nominal phrase mirrors that of a verbal phrase (vP/v*P), meaning that a nominal expression lacks layers which correspond to C and T layers in a CP. If this supposition is on the right track, it follows that a nominal lacks inherent tense and force properties², as already observed.

² Force properties of a given clause indicates the type of the clause, i.e., whether it is declarative, interrogative, or exclamatory and so on (Chomsky 2013b, Radford 2016,

Let us consider the internal structure of a nominalized phrase *John's refusal of the offer*. Chomsky (1972) states that *John's refusal of the offer* is an NP and the noun *refusal* serves as the noun head. He continues that the preposition phrase *of the offer* is the complement of the said noun head, and the possessive form *John's* is positioned in the specifier of this nominal phrase. Thus, *refusal of the offer* is N' and *John's refusal of the offer* as a whole is NP.

A cautionary remark which might threaten our nP hypothesis is in order here. Chomsky (1972: 53) mentions that the internal structure of the derived nominal like (4b) *John's refusal of the offer* mirrors its sentential counterpart, namely, (3) *John refused the offer*, rather than VP. Since the nP hypothesis holds that the internal structure of a nominal expression mirrors that of a verbal phrase (vP/v*P), this remark of Chomsky (1972) can undermine the nP analysis. However, rest assured that the nP hypothesis is not threatened by this analysis made by Chomsky (1972: 53). In the early 1970s, the CP and TP/INFL analysis was not prevalent and the sentential expression was just denoted as S. Furthermore, the internal structure of S was believed to be NP + VP (Chomsky 1972: 52), meaning that the X-bar analysis was then in its nascent stage and did not cover the clausal level. (To the best of my knowledge, CP analysis was proposed by Chomsky 1981 and Stowell 1981.) Therefore, Chomsky (1972) assumed that S had no C layer and the tense feature was positioned in the specifier of VP. In this context, Chomsky's original claim that the nominalized phrase corresponds to its sentential counterpart does not threaten the nP hypothesis, since neither C nor T layer was considered in the X-bar theory in its nascent stage.

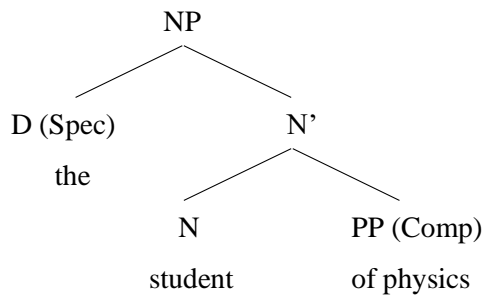
1.2.2 The DP hypothesis

As we have already seen, before the 1980s, a nominal was believed to be an NP and within this framework, determiners, demonstratives and quantifiers were believed to serve as the specifiers of NPs. Therefore, a nominal phrase such as *the student of physics* was analyzed as having the internal structure diagrammed in the tree below.

(6) a. {_{NP} the {_{N'} {_N student}, of physics} }

among others).

b.



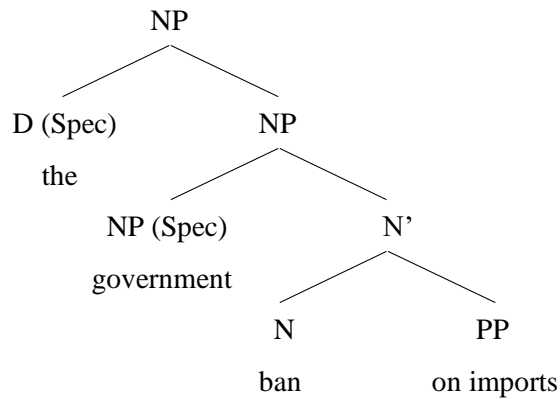
The constituent {student, of physics} is N' and adding *the* to the N' makes the whole constituent a maximal projection, i.e., an NP. However, the above analysis turns out to have some theoretically implausible points. Although X-bar theory holds that only a maximal projection (i.e., a full phrase) can serve as a specifier of a given phrase, the above analysis holds that the NP has as its specifier the definite determiner *the*, which is apparently a simplex lexical item, violating the X-bar scheme. Furthermore, Radford (2016) argues that the NP hypothesis cannot give an adequate analysis to examples like the italicized phrases in (7).

(7) The opposition will oppose *the/any government ban on imports*. (Radford 2016: 128)

Radford makes a statement to the effect that under the NP hypothesis shown above, the syntactic status of *government* is unclear. The definite determiner *the* already occupies the Spec-NP position. Thus, it is unclear what position the nominal in question (i.e., *government*) occupies. One way to get around this issue is to suppose a double specifier construction, as shown below (Radford 2016).

(8) a. {_{NP} the, {_{NP} government, {_{N'} {_N ban}, on imports}}}

b.

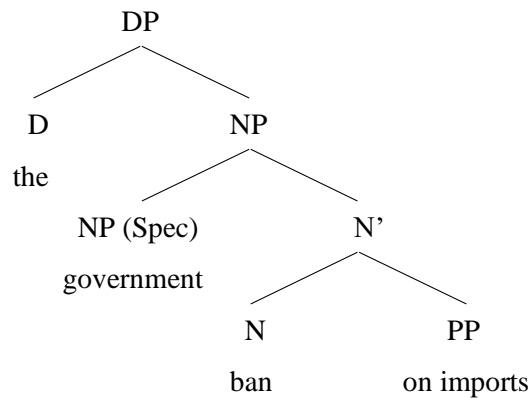


This analysis supposes that the given NP has two specifiers, i.e., the outer specifier *the* and the inner specifier *government*. However, such an analysis is simply ad hoc since all the other constructions including non-lexical ones have only one specifier per one maximal projection. Therefore, this kind of analysis advanced in (8) can be said to have been developed just for describing the internal structure of the example in (8). This means that the NP analysis is inadequate and an alternative approach is necessary.

In this background, Abney (1987), casting doubt on the NP hypothesis, argues that a nominal phrase is in fact headed by a functional category and that functional category is a determiner. Adopting his hypothesis, we can resolve the question as to the internal structure of the nominal phrase *the government ban on imports*, which can be analyzed as below.

(9) a. {_{DP} the, {_{NP} government, {_{N'} {_N ban}, on imports}}}

b.



The NP *government* occupies the specifier of NP and the definite determiner *the* serves as the head of the entire phrase, meaning that the entire phrase is a DP (Radford 2016). Therefore, one can claim that the DP hypothesis provides an adequate analysis for the example in (9). However, we challenge this analysis in Chapter 2, where we argue that *the government* is itself a nominal phrase, i.e., nP, and it is adjoined to (i.e., pair-merged with) another nP *ban on imports*.

Abney's original DP hypothesis also covers issues concerning the syntactic status of pronouns. Personal pronouns in English never cooccur with determiners, demonstratives, or possessive pronouns. Hence, the ungrammaticality of **the you*, **this he*, **my she* and so on. If all nominal phrases are DPs, there should be ways to address the issue as to why pronouns in English are used in their bare forms (i.e., without determiners). To this question, Abney (1987) has excellent answers. He observes that in phrases like *we linguists/you linguists*, personal pronouns such as *we* and *you* seem to serve as the determiner of the entire phrases. Based on these facts, Abney claims that personal pronouns like *we* and *you* are directly generated in the determiner positions, meaning that pronouns such as *we* and *you* are themselves determiners. Note that Abney's analysis leaves an asymmetry between pronouns and other nominal categories, since if Abney is correct, it follows that pronouns like *he* and *she* lack N layers, whereas other nominal phrases such as *the dog* and *a pen* have both D and N layers.

Longobardi (1994) further develops this DP hypothesis and overcomes the shortcomings of Abney's original analysis by claiming that pronouns and proper nouns in English originally occupy nominal head positions and then raise to the determiner positions to receive their referential properties, which, he argues, reside in Ds. Longobardi's supposition is more preferable than that of Abney since in Longobardi's approach, both pronouns and other nominals have the same internal structures.

Thus far, the DP hypothesis seems to be consummate and infallible. If so, it follows that the nominalized forms observed above must be DPs, rather than NPs. For instance, Hiraiwa (2005) supposes that the internal structure of a DP mirrors that of a CP and the D layer in a DP corresponds to the C layer in a CP. C has a Force property, which indicates whether a given clause is declarative, interrogative or exclamative and so on (Chomsky 2013 f, Radford 2009, among others). Hiraiwa and some other linguists such as Alexiadou et al. (2007) assume that this Force property is similar to the referential property associated with D. As for the counterpart of the T layer in CP, no convincing theory seems to have been advanced thus far.

For instance, Hiraiwa (2005) surmises a possessive layer (Poss) below the D layer just for formulating T's counterpart layer in a nominal expression, which is a dubious move at best. We suppose that this implausibility of the DP analysis arises because a nominal phrase is not a DP. Here, the nP hypothesis comes in.

In what follows, we challenge the DP hypothesis by making the following four arguments.

- (A) A nominal phrase is in fact a nP (Chomsky 2007, Chomsky et al. 2019, Oishi 2015).
- (B) The reason an nP has no layer which corresponds to the T layer in a CP is that the nominalization is a process in which a v/n alternation changes a given verbal phrase into a nP. Therefore, the nominalization nominalizes vP, rather than CP.
- (C) A determiner is a morphologically complex element (Leu 2015), thereby unable to label a syntactic object within the framework of labelling algorithm (Chomsky et al. 2019, Oishi 2015)
- (D) The referential properties of nominals come from adjoined (i.e., Pair-Merged) phrases.

Chapter 2

The Labelling Algorithm and the nP hypothesis

2.1 Merge based derivational approaches

This chapter considers the validity of the nP hypothesis within the framework of the labelling algorithm proposed in Chomsky (2013a, 2015a, 2020). The present framework was developed to augment the merge-based derivational approaches. Let us examine first the operation Merge.

Chomsky (1994 *et seq.*) believes that phrases and sentences of human languages are constructed by Merge, which he believes is the simplest combinatorial operation. Merge is a binary set formational operation, meaning that merger of X and Y gives rise to just an unordered set $\{X, Y\}$ and no other objects including indices, bar levels and categorical information of the attained structure $\{X, Y\}$ are generated (Chomsky 2004 *et seq.*). This condition is known in the literature as Minimal Yield, which is formalized as below (Chomsky 2021).

(1) Minimal Yield (Chomsky 2021:19)

Merge should construct the fewest possible new items that are accessible to further operations. [...] Merge (P, Q) necessarily construct one such SO [syntactic object—H.T.]: $\{P, Q\}$ itself. It should yield no more than that.

Merger comes in two forms; External Merge and Internal Merge (Chomsky 2021, among others). External Merge (EM) combines two elements X and Y, neither of which contains the other. Chomsky (2021, forthcoming) supposes that External Merge is associated with theta-markings, meaning that semantic roles are assigned to constituents Externally Merged to the theta-positions. On the other hand, Internal Merge (IM) forms a set $\{X, Y\}$ out of two constituents X and Y, where either X or Y contains the other (Chomsky 2013a, 2019a, among others). For instance, consider (11).

(2) I do not know $\{\gamma$ what, $\{\beta$ he $\{\alpha$ bought, what $\}\}$.

In (2), *bought* and *what* are Externally Merged to form α and the verb *bought*, being a theta-assigner, assigns the theta-role of THEME to *what*. α is then Externally Merged with the external argument *he*, deriving β . Note that in this case, α as a whole assigns the semantic role of AGENT to the external argument *he* (Chomsky 2015a:13 f., forthcoming:9, Radford 2009). Then, β and *what* merge to form γ and this case is what Chomsky (2004 *et seq.*) refers to as Internal Merge, since β contains *what*. Notice that the Internally Merged phrase *what* does not receive any new semantic roles from β . Chomsky (2021, forthcoming) believes that Internal Merge is associated with discourse properties and information structures, rather than theta-role assignments.

Another important point about IM is that an Internally Merged item leaves its copy in its extraction site. In (2), the question pronoun *what*, when internally merged with β , leaves its copy in the position it originated in α . The copy of *what* left in α is silenced when the syntactic structure is mapped to the Sensory-Motor interface (SM), in which an appropriate phonological representation is assigned to the syntactic structure dispatched to it (Chomsky 2007 *et seq.*).

According to Chomsky (2008 *et seq.*), a copy generated by IM remains intact in the Narrow Syntax (NS), where structures are constructed by merger. A syntactic structure constructed by merger in NS is then mapped to the Conceptual-Intentional interface (CI) for semantic interpretation when the derivation reaches a phase, which is to be explained below (Chomsky 2000 *et seq.*). Since copies remain intact in their original positions, the burden for reconstructions is significantly reduced, or possibly zero (Chomsky 2007 *et seq.*) and this is the first reason a copy remains intact in NS. The second reason a copy remains intact in NS and C-I is that it is against the No-Tampering condition to delete or change an already constructed constituent (Chomsky 2008 *et seq.*). The No-Tampering condition stipulates that once a syntactic object $\{X, Y\}$ is constructed by merger of X and Y, it is immune to further modifications, thereby significantly reducing the computational burden (Ibid.). Chomsky (2019b) states that if modification of a syntactic structure already constructed were allowed, the computational burden would be tremendous, which is theoretically implausible. Chomsky's recent argument seems to be that our brains are so slow that computational burden should be minimized (see e.g., Chomsky 2019a, 2021). Therefore, deletion of a constituent in an already constructed structure must be banned (Chomsky 2019b).

The reason a Merge-based approach is adopted in the generative field is that the

human language faculty (Faculty of Language; FL) is believed to have arisen through an evolution we experienced at a certain time in the past (Chomsky 2008 *et seq.*). If so, the Faculty of Language must “be simple enough to have evolved under the conditions of human evolution” (Chomsky 2021:7). This is known in the literature as the evolvability condition of human language. To meet this condition, the structure-building operations of human language must be simple enough and, in this context, Chomsky (2021) proposes merger as the sole structure-building operation. The traditional X-bar theory was eliminated from legitimate analyses since one cannot claim that such a complex structure as the X-bar scheme arose in the evolutionary adaptation noted earlier.

However, the Merge-based approach to human languages, though plausible on evolutionary grounds, is faced with descriptive difficulties. As has already been observed, merger yields only unordered sets, meaning that it does not give rise to categorical information of the syntactic structures constructed. However, Chomsky (2013a) supposes that a syntactic object (SO) needs its categorical information for it to be interpreted at interfaces. For instance, for the reason of interpretation, the CI interface needs to be aware of whether the relevant syntactic object is verbal or nominal (Chomsky 2013a), and likewise, for prosodical reasons³, the SM interface needs to be aware of the grammatical categories of the relevant syntactic objects. Therefore, a way to assign categorical information to the attained syntactic object is necessary and Chomsky (2013a, 2015a, 2020) assigns this task to a labelling algorithm, which is an instance of Minimal Search.

2.2 The Labelling Algorithm (Chomsky 2013a, 2015a, 2020)

As we have already observed, in the generative field, Merge is believed to be the sole legitimate structure building operation (we put aside Pair-Merge here for clarity) and it does not provide categorical information of the object constructed. As noted above, merger of X and Y yields only an unordered set {X, Y}, giving rise to no other objects including categorical information about the relevant structure (Chomsky 2007 *et seq.* especially Chomsky’s (2021) Minimal Yield). Therefore, the constructed object {X, Y} does not specify its own categorical information. In other words, the syntactic object {X, Y} does not tell us anything about its grammatical category. However, for semantic reasons, the Conceptual-Intentional interface needs to be aware of the categorical statuses of syntactic objects dispatched to it.

³ Shuntarô Tida (p.c.) brought the appropriate terminology *prosody* to my mind.

To address this issue, Chomsky (2013a) proposes labelling algorithm (LA), which is an instance of Minimal Search (MS). Minimal Search (MS) searches the attained syntactic object for a relevant target and terminates the search when it finds its target (Chomsky 2021). Since the labelling algorithm is a kind of Minimal Search, it applies independently of merger (Chomsky 2013a, 2015a). Chomsky (2013a, 2015a) supposes that LA seeks a head or features on a head in its search domain and once LA finds the relevant head or features, the search operation terminates there and returns a head or features as the label of the syntactic object in question (Chomsky 2013a, 2015a, Ke 2019).

Since a head serves as the label of a syntactic object whereas a phrase cannot do so, the head-phasal distinction plays a crucial role in the labelling framework. According to Chomsky (2013a), a phrase is a syntactic object constructed by merger, whereas a head is a syntactic object which is **not** built by merger. This implies that each lexical item stored in the Lexicon can serve as a head, since they are not constructed by Merge. On the other hand, complex items such as {the, dog}, which is obviously constructed by merger of smaller items, are phrasal, thus unable to provide labels for relevant syntactic objects.

Let us see how the labelling algorithm works. In the case of labelling a syntactic object {X, YP}, X being a head and YP being a phrase, the labelling procedure is straightforward. Chomsky (2013a) supposes that the labelling algorithm finds the head X and labels the relevant syntactic object as X (or XP).

Let us consider a concrete case. For instance, when the derivation reaches the stage of {C, TP}, the labelling algorithm applies and searches the syntactic object {C, TP} for a head. Once LA finds the head C, the search terminates and LA labels the relevant syntactic object {C, TP} as CP (Chomsky 2013a, 2015a).

Things get complicated when labelling an exocentric structure {XP, YP}, with both phrasal XP and YP, meaning that both XP and YP are constructed by merger of smaller elements. In such cases, Chomsky (2013a) claims that a labelling algorithm, searching {XP, YP}, simultaneously finds both heads, X and Y, and, as a consequence, is unable to label the relevant syntactic object {XP, YP}. In such cases, Chomsky (2013a) argues that the syntactic object {XP, YP} receives its label either by (i) modifying its structure or (ii) the labelling algorithm finding the feature(s) shared by both XP and YP. Let us consider the case of (i) first.

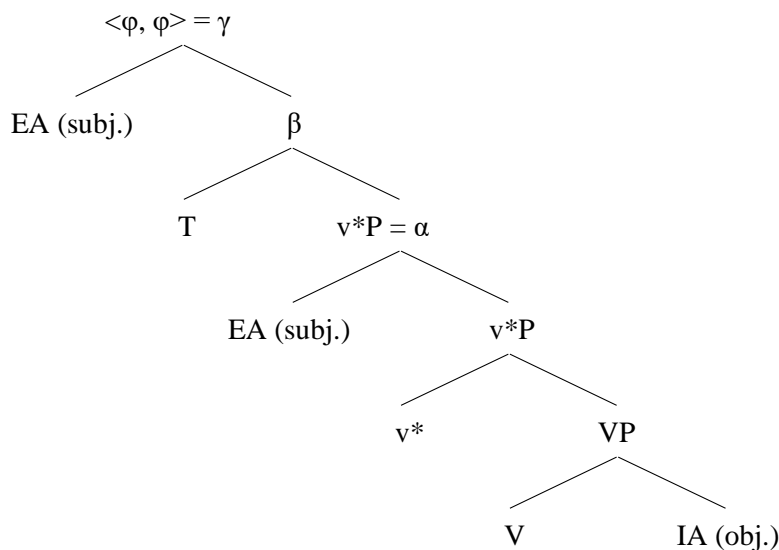
In the case of (i), the syntactic object {XP, YP} is modified by raising either XP or YP to some higher position, deriving the new syntactic structure $\{\beta \text{ XP}, \dots, \{\alpha \text{ XP}, \text{ YP}\}\}$. Note that XP in α is a copy left by Internal Merge. Chomsky (2013a) claims that the two XPs in α and β are two occurrences of a single discontinuous phrase XP. He further argues that a syntactic

object XP is visible to the labeling algorithm only when all the occurrences of the XP are inside the relevant search domain. Therefore, once XP in α is raised by Internal Merge to some higher position to derive the current syntactic structure $\{\beta \text{ XP}, \dots, \{\alpha \text{ XP}, \text{YP}\}\}$, the XP in α becomes invisible to the labelling algorithm searching the domain α . In this fashion, α is labelled as YP in accordance with the sole visible head Y in α (Chomsky 2013a).

In the case of (ii), a labelling algorithm finds features shared by both XP and YP, labelling the relevant syntactic object according to its shared features (Chomsky 2013a, 2015a). In such cases, typically, XP and YP agree regarding the shared features (ibid.). Note that in this case, neither XP nor YP raises to some higher position. To make the explanation more concrete, let us consider the schematic structure in (3) below, where v^* is a verbal functional category associated with transitive constructions.

- (3) a. $\{\gamma \text{ External Argument}, \{\beta \text{ T}, \{\alpha \text{ External Argument}, v^* \text{P}\}\}\}$
 (e.g., “The doctor saved the life of the patient.”)

b.



Since a phrase such as *the doctor* can stand as a subject, EA is phrasal. Therefore, α in (3a) is faced with a familiar labelling issue, which can be resolved by raising the external argument (EA) by IM to the surface subject position (i.e., “specifier of TP” in the traditional terminology) (Chomsky 2013a). In this fashion, EA in α becomes invisible to the labelling algorithm whose search domain is α and α is then labelled as $v^* \text{P}$, in accordance with the sole

visible head v^* (ibid.).

Labelling of β is straightforward, since β is of the form $\{T, v^*P\}$, thus a simple $\{X, YP\}$ configuration. Therefore, β is labelled as TP in accordance with the sole visible head T in this domain.

Another labelling issue arises in γ , which also has two phrasal constituents, with one being the raised EA and the other being the TP. This means that γ is a familiar $\{XP, YP\}$ configuration. In this case, the raising approach is barred on empirical grounds; in a declarative sentence in the English language, a subject (EA) remains in γ , rather than raising to some higher position such as spec-CP. This means that we need an alternative approach to label β . Chomsky (2013a, 2015a) resolves this labelling issue by resorting to agreement between EA and T. He supposes that the prominent features on T are in fact ϕ features⁴, ϕ standing for person-number (and gender for some languages). Chomsky (2015a) suggests that the unvalued ϕ features on T agree with valued ϕ features on the External Argument, with the unvalued ϕ features on the T receiving the values of those on the External Argument (see also Chomsky 2004). Chomsky (2007:19) supposes that once valued, ϕ features on the T become indistinguishable from the valued ϕ features on the EA. Therefore, the labelling algorithm searching β finds two sets of valued ϕ features, with one set of ϕ features on the external argument and the other one on the T. Chomsky (2013a, 2015a) suggests that in a strict sense, LA seeks features on a head, rather than the head itself. In light of this remark, Chomsky (2013a, 2015a) supposes that LA labels $\beta <\phi, \phi>$ in accordance with the prominent features on both EA and T.

Summarizing thus far, labelling of $\{XP, YP\}$, both XP and YP phrasal, is faced with a labelling issue which can be resolved either by (i) modifying the syntactic object $\{XP, YP\}$ so that either XP or YP would be invisible to LA, or (ii) LA finding the features shared both by XP and YP, with XP and YP agreeing regarding the shared features. An important implication of this framework is that a labelling failure results in a successive cyclic raising of a phrase, which terminates when the raised phrase is merged with its agree mate⁵ (Chomsky 2013a, 2015a).

Logically, the first step of any derivation must be merger of X and Y, both X and Y

⁴ If so, the label of β must be reconsidered. Labelling of β is faced with a new problem, since the prominent features on T at this stage are unvalued ϕ features, which are not qualified as the label of β . Chomsky (2015a) overcomes this shortcoming in his POP+ framework, as we will see below.

⁵ The position where successive cyclic movement terminate is referred to as “critical position” (Chomsky 2015a).

being heads (i.e., lexical items). Thus, the resulting structure is of the form $\{X, Y\}$. Labelling of this configuration must be problematic since LA find both X and Y simultaneously, therefore unable to label the relevant syntactic object (Chomsky 2013a, 2015a). Chomsky address this issue by adopting the root and categorizer thesis developed by Borer (2005, 2013) and Marantz (1997), which is to be explained in the next section.

2.3 The derivation of v^*P

As the previous section has covered the overview of the labelling algorithm, this section considers the internal structures of both v^*P and nP . Since the nP hypothesis holds that the internal structure of a nominal phrase mirrors that of a verbal phrase, we first consider the internal structure of v^*P/vP before that of nP .

Suppose any lexical item stored in the Lexicon is simplex, meaning that it is not constructed by merger of smaller items (Chomsky 2013a). Then, the first step of the derivation of any category will be tormented with the labelling issue we did not delve into in the previous section, that is, the labelling of a structure of the form $\{X, Y\}$, both X and Y being heads (Chomsky 2013a). Since merger combines two items, and the initial step of the derivation of any category is merger of two lexical items X and Y, this type of labelling issue is inevitable (ibid.). Chomsky (2013a) overcomes this problem by adopting the root and categorizer thesis proposed by Marantz (1997) and Borer (2005, 2013).

Chomsky (2013a) argues that lexical items are divided into two kinds: one is a root and the other is a categorizer⁶. This claim made by Chomsky (2013a) is based on a proposal made by Marantz (1997), where a category unspecific lexical root merges with a verbalizer or nominalizer to form a verb phrase or noun phrase, respectively. Adopting this hypothesis, Chomsky (2013a, 2015a) argues that a category neutral root R is too weak to label on its own. Therefore, a root needs to merge with a category provider to label the entire structure and Chomsky (2013a *et seq.*) names this category provider a categorizer K. In the framework developed in Chomsky (2013a), referred to as the POP framework in the literature, (with POP standing for “Problems of projection”, the title of the thesis in which this framework is explained), Chomsky argues that a lexical root R merges with a categorizer K to form a

⁶ It is unclear whether C belongs to a categorizer or root. In certain respects, C is more like a categorizer than a root. For instance, C passes its unvalued ϕ features to T (R), like v^* , which is a categorizer. Furthermore, Chomsky (2001) supposes that a phrase (which is to be explained below) is a configuration of the form $\{K, XP\}$, where K stands for a categorizer and XP for a phrase. Since v^* and C are phasal heads (ibid.), it is reasonable to suppose that C is also a categorizer. In this respect, the present thesis considers C to be a kind of categorizer.

syntactic object $\{K, R\}$, which is labelled as K in accordance with the sole category provider K in this phrase, thus resolving the labelling ambiguity of the $\{X, Y\}$ configuration (Chomsky 2013a).

In the POP framework, we can take a categorizer to be a functional category which assigns a grammatical category to the structure $\{K, R\}$ constructed by merger of the categorizer K and a category unspecified lexical root R (Chomsky 2013a). Chomsky supposes categorizers K are affixal (Chomsky 2015a) and consist of *v*, *n*, *a* and *p*, with *a* and *p* being categorizers for adjectives and adpositions, respectively (Chomsky 2021). For instance, in the POP framework, a syntactic object $\{v, R\}$, which is constructed by merger of a verbal categorizer *v* and a category neutral lexical root R, is labelled verbal in accordance with the verbal categorizer *v* (Chomsky 2013a). And the same line of analysis applies to other $\{X, Y\}$ configurations. For instance, a syntactic object $\{n, R\}$, built by merger of a nominal categorizer *n* and a category neutral lexical root R, is labelled nominal in accordance with the nominal categorizer *n* (ibid.).

Although the POP framework seems to provide an elegant solution to the labelling of the $\{X, Y\}$ configurations along with other logically possible ones (i.e., $\{X, YP\}$ and $\{XP, YP\}$ configurations), this framework itself turned out to have flows, as pointed out by Epstein et al. (2012). According to Epstein et al. (2012), the POP framework and the earlier analysis this framework is based upon (e.g., Chomsky 2008) adopt counter-cyclic operations, which is conceptually unacceptable in the generative field. Within the framework assumed in Chomsky (2008), an External Argument EA originates in the specifier of v^*P and then, after C enters the derivation and transmits its ϕ and tense features to T, is Internally Merged to the specifier of TP, driven by the EPP feature on T. Epstein et al. (2012) argue that this movement operation is counter cyclic since the movement of EA applies **after** C is introduced to the derivation but involves the T head, rather than the C head (see also Narita 2011:57-58 for relevant discussion). To make the explanation more concrete, let us consider the derivation of a sentence with a transitive verbal construction *Mary bought this PC*. Under Chomsky's (2007, 2008) analysis, the derivation proceeds as shown below.

- (4) a. $\{v^*P \text{ Mary}, \{v^*, \{v_P \text{ bought}, \{\text{this}, PC\}\}\}\}$
 b. $\{T, \{v^*P \text{ Mary}, \{v^*, \{v_P \text{ bought}, \{\text{this}, PC\}\}\}\}\}$
 c. $\{CP \text{ C}, \{T, \{v^*P \text{ Mary}, \{v^*, \{v_P \text{ bought}, \{\text{this}, PC\}\}\}\}\}\}$
 d. $\{CP \text{ C}, \{TP \text{ Mary}, \{T, \{v^*P \text{ Mary}, \{v^*, \{v_P \text{ bought}, \{\text{this}, PC\}\}\}\}\}\}\}$

As shown in (4a), v^*P is constructed by External Merge and all the relevant arguments receive their theta-roles in this configuration along the lines of the framework outlined above. The resulting v^*P is then merged with T, deriving the structure in (4b). As has been noted above, within the framework assumed in Chomsky (2007, 2008), C enters the derivation at this point as shown in (4c). In (4c), Chomsky (2007, 2008) supposes that C transmits its φ and tense features to T and after this feature inheritance has applied, the External Argument *Mary* is raised from spec- v^*P to spec-TP.

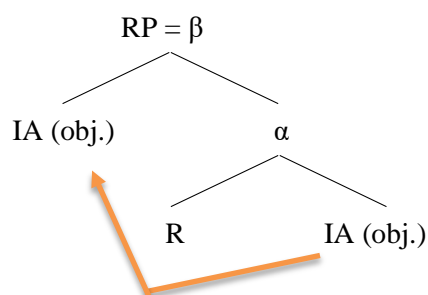
Since the EA raising applies in (4c), where C has already entered the derivation, the movement must involve the C head. Nevertheless, as Epstein et al. (2012) point out, the movement in question does not involve the C head, but rather involves the T head. In this regard, this movement, Epstein et al. (2012) claim, is counter-cyclic and thus must be avoided. The POP framework discussed in this section also adopts a similar system and employs this type of counter-cyclic operation, therefore being theoretically unpalatable. In response to this criticism, Chomsky (2015a) refines the present theory, establishing a new framework known in the literature as the POP+ framework, with POP+ standing for “Problems of Projections: Extensions”, the title of the thesis in which this newer framework is elaborated on. In the POP+ framework, as we will directly see, this kind of counter-cyclic movement is abandoned and Chomsky (2015a) supposes that Merge applies freely, thereby raising to subject (i.e., raising to the spec-TP) taking place before C enters the derivation and φ feature agreement applying after C is introduced into the derivation. To illustrate this new framework, let us consider the derivation of a verb phrase with a full argument structure. Within the POP* framework, its derivation proceeds as follows.

Since the verb phrase we are considering has a full argument structure, it is denoted as v^*p , with v^* being a notation for transitive or experience verb constructions (Chomsky 2005, 2008). On the other hand, vP is the notation associated with unaccusative and passive constructions, both of which lack agentive External Arguments, which originate in the Spec- v^* positions. As the initial step of the derivation of v^*P , Chomsky (2015a) supposes that a lexical root R and the Internal Argument IA are Merged to form $\{\alpha R, IA\}$.

Since the Internal Argument IA is phrasal, α is of the form $\{X, YP\}$. Therefore, at first sight, one might take X to be able to label α . However, in this case, X is a category neutral root R, and is thus unable to label α . Within the POP+ framework, Chomsky (2015a) argues that the Internal Argument then raises to “the specifier” of R by Internal Merge (IM), deriving the structure $\{\beta IA, \{\alpha R, IA\}\}$, as shown in (5).

(5) a. $\{\beta \text{ IA}, \{\alpha \text{ R}, \text{ IA}\}\}$

b.



Chomsky (2015a:10) notes in passing that the Internally Merged IA “strengthens” R and as a consequence, α is to be labelled a root phrase RP when the labelling algorithm applies, though this claim contradicts Chomsky (2013a), where he explicitly states that R is too weak to label since it has no category on its own. Chomsky (2015a:10) is not clear on mechanisms under which the lexical root R labels the structure $\{\text{R}, \text{IA}\}$, a topic to which we will return below to consider this matter with feature inheritance from v^* .

Within the POP+ framework, neither α nor β in $\{\beta \text{ IA}, \{\alpha \text{ R}, \text{ IA}\}\}$ has received a label at this point of the derivation. This is because the labelling algorithm applies at the phase level (Chomsky 2013a, 2015a), and since the current derivation has not yet reached the phasal level, label-less syntactic objects are accepted at this stage of the derivation (Chomsky 2015a).

Phase is a notation introduced to capture the strict-cyclic properties of syntactic operations. It has been well known since the early days of the generative enterprise (e.g., Ross (1967)) that certain syntactic categories, once constructed, are immune to further syntactic modifications. For instance, CP belongs to such a category and once it is constructed, its interior is protected from further modification, as shown in (6).

(6) a. He thinks [you are smart].

b. *He thinks [you is smart]

(6b) is judged ungrammatical as the verb in the embedded clause agrees with the subject in the matrix clause (i.e., *he*). In other words, the agreement operation regarding the subject in the main clause cannot penetrate the C layer of the embedded clause, with C behaving like a barrier to such a syntactic operation. Grammatical categories such as CPs, which protect their interiors from further modifications, were traditionally referred to as *barriers* (Chomsky 1986), and in even earlier framework this kind of phenomenon was captured by supposing the

subjacency condition (e.g., see Chomsky 1973, 1977). However, whether certain syntactic objects are barriers or not is a mere stipulation and lacks principled motivations. In other words, barrierhood (Chomsky 1986) or the subjacency condition (e.g., Chomsky 1973, 1977) does not provide principled answers to the question as to why certain grammatical categories, once constructed, are not subject to further syntactic modifications. To such phenomena, Chomsky (2000 *et seq.*), under the minimalist approach, gives more adequate explanations. He argues that syntactic objects are not constructed all at once but are built in a stepwise fashion. Chomsky (2000 *et seq.*) names such small syntactic objects *phases* and continues that upon completion of each phase, its interior (i.e., the complement of each phase head) is transferred to interfaces for interpretation and spell out (Chomsky 2000 *et seq.*). As the reason for this supposition, Chomsky points out that the dispatchment of the interior of each completed phase significantly reduces the computational burden for narrow syntax, since a phasal domain, once transferred to the interfaces, he argues, is erased from narrow syntax (Chomsky 2000, 2004, 2008, among others). Chomsky's argument goes that as the domain of a phase head, once Transfer has taken place, disappears from narrow syntax, it is immune to further syntactic modifications. A phasehood is activated when a phase head is introduced to the derivation and all the relevant syntactic operations regarding the phasal head in question have applied (such as agreement and Internal Merge). Thus, the phase impenetrability condition in (7) ensues.

(7) Phase -Impenetrability Condition (Chomsky 2000:108)

In phase α with head H, the domain of H [i.e., the complement of H—HT] is not accessible to operations outside α , only H and its edge [i.e., specifier and any constituents adjoined to the head H—HT] are accessible to such operations.

(Chomsky 2000:108, bracketed phrases are added by the author for expository purposes)

Note that since what is transferred to the interfaces is the domain (i.e., the complement) of a phase head, the phase head itself and its specifier are subject to further syntactic operations.

Although which grammatical categories count as phases is a contentious matter, we assume with Chomsky (2001, 2008, 2015a, 2021 among others) that v*P and CP are phases. Chomsky's original criteria for phasehood are based upon (i) the propositional status and (ii) prosodical independence of these constituents (Chomsky 2001:12 *et seq.*). According to him, both v*P and CP have full argument structures and thereby their statuses as propositionally

complete elements are justified. Thus, v*P and CP, he argues, belong to phases. Indeed, both v*P and CP are semantically complete elements, though v*P lacks tense and force properties, and if so, Chomsky's claim that such structures count as phases is convincing. On prosodical independence of v*P and CP, Chomsky (2001) is not so clear, though we are sure that everyone agrees that a CP has its own prosodical independence since it is a clausal element. On the phonetic independence of v*P, consider the below example of v*P fronting.

(8) A: Have you really washed the car?

B: Wash the car, I did.

The fronted v*P *wash the car* has prosodical independence to some degree, though Chomsky (2001:12) admits that the same also applies to vP. Thus, prosodical independence does not serve as a stringent criterion of phasehood.

Since his original criteria for phasehood, though plausible to some degree, are not complete, Chomsky in his recent papers presents ones based on more conceptual grounds. For instance, Chomsky (2015a:5) argues that phases are loci of unvalued features and thereby characterized by their properties of assigning their unvalued features to the heads immediately taken by them. In this regard, C and v* serve as qualified candidates for phase heads, since C and v* assign their unvalued ϕ features to T and R, respectively. Therefore, under this criterion, CP and v*P are phases, as predicted in Chomsky (2001 *et seq.*).

As a side comment here, Chomsky adds that there is a possibility that a PP and nP are also phases (Chomsky forthcoming and 2021:19, respectively)⁷.

Another contentious matter is whether or not a syntactic object is erased from narrow syntax when Transfer applies. Although Chomsky (2000, 2001, 2004, 2008, among others) supposes that Transfer literally strips away the relevant phasal domain from narrow syntax, Obata (2010), Sugimoto (2022), and Chomsky et al. (2019), citing examples like (9) below, cast doubt on this strong hypothesis, arguing that a phasal domain is not erased from narrow syntax even after the relevant phase has been completed.

(9) [_{α} the verdict [_{β} that Tom Jones is guilty]] seems to have been reached (α) by the jury.

⁷ For different views as to which grammatical categories count as phases and the criteria for phasehood, see among others Bošković (2014), who argues that every extended projection of a lexical item, i.e., A, N, P, and V is a phase and McInnerney (2022), in which the author advances a persuasive claim that some kinds of preposition serve as phase heads.

Chomsky et al. (2019) state that the large DP α originates in the position indicated by (α) and is then raised to the surface subject position. If a phasal domain were sent to the interfaces upon completion of each phase and were then spelled out at that step of the derivation, the phasal domain TP *Tom Jones is guilty* in β would be spelled out in (α), thereby yielding the below phonological representation (10), which is obviously ill formed.

(10) * $[_\alpha$ the verdict $[_\beta$ that *t*]] seems to have been reached [Tom Jones is guilty] by the jury⁸.

One way to get around this implausible output is to adopt Late Merge proposed in Chomsky (2004), where an adjunct can be inserted late into the derivation, and insert the CP β after the DP *the verdict* has reached the surface subject position. Although the CP β *that Tom Jones is guilty* is not an adjunct phrase in a strict sense, one seems to be able to stretch Chomsky's (2004) argument and take the well-formed (9) to be derived by Late Merging β . However, within the MERGE framework developed by Chomsky (2019a, 2019b, 2021), which is to be explored below, Late Merge is banned as an illegitimate syntactic operation, resulting in the late insertion of the CP β being unavailable. This means that the large DP α needs to be generated as a whole in the (α) position in (9), and as a result, under the definition of phase, where a phase domain is expected to be spelled out at each phasal level, the well-formed (9) is an unavailable output.

Summarizing thus far, the definition of phase is based on Chomsky's (2000, 2008) supposition that the phasal domain is transferred to interfaces at each phasal level, thus spelled out at that time, though recent research (e.g., Obata 2010, Chomsky et al. 2019, Sugimoto

⁸ If we leave the complementizer *that* in its original position, rather than raising it with the DP *the verdict*, the output will be (i).

(i) ??The verdict seems to have been reached [that Tom Jones is guilty] by the jury.

Note that its grammaticality has noticeably improved compared to its ill formed counterpart in (10), though we are unable to resort to this strategy. The reason for this is that the definition of the phase itself dictates that when the derivation has reached the phase level, the domain of the phase head in question, rather than the phase head itself, is transferred to interfaces (Chomsky 2000, among others, see Chomsky 2001 and Ke 2019 for the view that Transfer is triggered when the next highest phase head has entered the derivation). Since we take CP to be a phase, the C *that* is a phase head and, according to the definition of phase, it must not be dispatched to the interfaces along with the phasal domain in question. Thus, (i) is unavailable in the present framework.

2022) reveals that Spell Out does not apply at each phase level, thus lending implausibility to Chomsky's original definition of phases, particularly to the part concerning Transfer to the SM interface at each phasal level.

In this respect, some researchers have made efforts to modify the definition of phase and argue that the syntactic object in question is not erased from narrow syntax even after the derivation has reached a phase level (e.g., Sugimoto 2022). If so, a new question arises as to what happens at each phasal level. Sugimoto (2022) suggests that at each phase level, the relevant phasal domain becomes inaccessible to further computation in accordance with the Phase Impenetrability Condition (PIC), though Transfer to the interfaces does not apply at that timing but applies only after the highest phase in the root clause has been constructed. In short, he argues that phase is not for Transfer to the interfaces but for reducing computational burdens for further syntactic operations. Indeed, under Sugimoto's analysis, computational burden is minimized, since phasal domains are inaccessible to further syntactic operations. However, Sugimoto (2022) does not give a principled explanation to the question as to why a phasal domain, once the relevant phase has been constructed, is invisible to further syntactic operations. Put another way, Sugimoto's proposal sounds like a stipulation, rather than an explanation; he just states that phasal domain becomes inaccessible at each phasal level to reduce the computational burden. Thus, although his analysis is plausible in that it yields the well-formed (9), we are not able to adopt his proposal. Since empirical data by and large support the Phase Impenetrability Condition (but see Bošković 2007 for languages in which Agree penetrates a phasal domain), we need to take into account the Phase Impenetrability Condition (PIC). Furthermore, there must be principled explanations for why PIC holds.

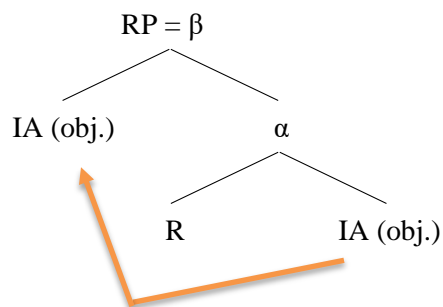
In these regards, it is reasonable to adopt Chomsky et al.'s (2019) suggestion, where at each phasal domain, Transfer dispatches the relevant syntactic object to the CI interface alone, but crucially not to the SM interface. Transfer to the SM interface, they suggest, applies when the highest phase in the relevant derivation has been constructed, meaning that Spell Out applies in one fell swoop (i.e., all at once). Their supposition is plausible in that it captures both PIC and the empirical data presented in (9). Since at each phasal level, the relevant syntactic object is shipped to the CI interface, the model presented in Chomsky et al. (2019) captures PIC. Furthermore, since Spell Out applies at the last stage of derivation, their model correctly derives the well-formed (9), with the relevant TP *Tom Jones is guilty* spelled at the surface subject position. This model, obviously assuming an asymmetry between the SM and CI interfaces, is based on Chomsky's (2014:7, 2019a, 2019b) claim that narrow syntax yields structures mainly for the CI interface, with mapping to the SM interface relegated to

secondary importance. As the reason for this asymmetry, Chomsky (2014, 2019a, 2019b) claims that language is a thought-generating system and narrow syntax yields structures mainly for the CI interface, which, Chomsky (2014) states, is essentially our thought. Chomsky (2014, 2019a, 2019b) further supposes that mapping of syntactic structures to the SM interface has only a secondary importance, thereby lending a theoretical support to the asymmetry between the SM and CI interface noted earlier.

With the phase theory in mind, let us return to the derivation of v^*P . Thus far, we have constructed $\{\beta IA, \{\alpha R, IA\}\}$ by raising the Internal Argument IA by Internal Merge, as shown in (11).

(11) a. $\{\beta IA, \{\alpha R, IA\}\}$

b.

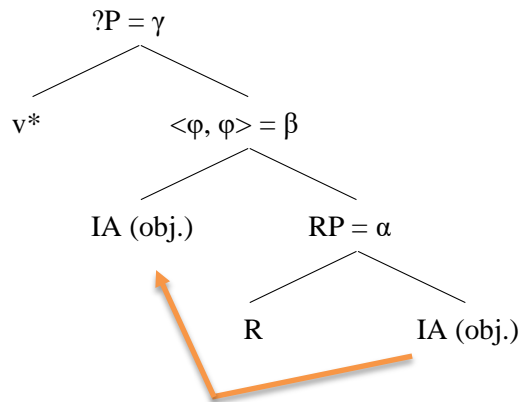


Since the derivation has not yet reached the phase level, the structure is not yet dispatched to the CI interface, where interpretation takes place. Since syntactic labels are necessary for interpretations at interfaces, syntactic objects without labels are acceptable at this stage of the derivation (Chomsky 2015a).

The structure so far constructed is then Merged with v^* , resulting in $\{\gamma v^*, \{\beta IA, \{\alpha R, IA\}\}\}$, the internal structure of which is shown in (12) below.

(12) a. $\{\gamma v^*, \{\beta IA, \{\alpha R, IA\}\}\}$ (e.g., “save the life of the patient”)

b.



Since v^* has entered the derivation, the derivation has now reached the phase level. At this point, the domain (i.e., the complement) of the phase head v^* is dispatched to the CI interface for the interpretation, necessitating labels (Chomsky 2015a). Within the POP+ framework, the labelling procedure of β mirrors that of TP, or more precisely $\langle \varphi, \varphi \rangle$.

Chomsky (2007, 2008) supposes that the phase heads C and v^* are the loci of unvalued φ features and these unvalued φ features are inherited by heads selected by the respective phase heads (see also Richards 2007 for relevant discussion). This means that T and R heads inherit unvalued φ features from the phasal heads C and v^* , respectively (Chomsky 2007, 2008, Richards 2007). Since both T and R receive unvalued φ features from phasal heads, Chomsky (2015a:9) suggests that T is analogous to R in that both of them lack significant features while they are stored in the Lexicon. Further theoretical support for this claim comes from Chomsky's (2007, 2008) supposition that even tense feature originates on C and is then dispatched to T⁹, meaning that T has no prominent inherent features while stored in the Lexicon, analogous to R. If this line of argument is on the right track, it follows that both T and R heads are too weak to provide labels on their own, as claimed in Chomsky (2015a:9). Thus, T and R resort to agreement with their “specifiers” to receive their labels. Let us consider the labelling procedure of β , i.e., $\{\beta \text{ IA}, \{\alpha \text{ R}, \text{IA}\}\}$, which should be analogous to that of TP. That is, R in α inherits the unvalued φ features from the phasal head v^* and then, the unvalued φ agree with the valued φ on the internal argument in “the specifier” of R¹⁰

⁹ However, see Chomsky (2021) for the view that the tense feature resides in v/v^* .

¹⁰ Chomsky (2015c) suggests that Agree is done by Minimal Search. For details, see Tanigawa (2023) and Ke (2023). For traditional view of Agree, which we adopt here for an expository purpose, see Chomsky (2000, 2001).

(Chomsky 2000, 2001). As Chomsky (2007:19) argues that once valued, φ features on the T are indistinguishable from ones on the External Argument EA, LA, searching β , finds two sets of valued φ features, one on the R and the other on the Internal Argument, and in such a case, the φ features serve as the label for the relevant syntactic object (Chomsky 2013a, 2015a, Chomsky et al. 2023). In this fashion, β is labelled $\langle\varphi, \varphi\rangle$.

Let us here return to the labeling procedure of α , i.e., the configuration of the form $\{R, IA\}$. Recall that we have labelled this syntactic object a root phrase RP in accordance with Chomsky's (2015a:10) suggestion that "R can label RP after object-raising [i.e., raising of the Internal Argument IA to the "specifier of R" — H.T.]" Since Chomsky is not clear about the mechanism behind this labelling procedure, we reconsider this labelling procedure in consideration of the proposal put forth in Sugimoto (2022), where the phrase in question, i.e., $\{R, IA\} = \alpha$, is labelled a root phrase RP with strengthening of R by " φ agreement with a DP in its specifier" (Sugimoto 2022:152). Note that Chomsky's proposal and Sugimoto's are different in that under Chomsky's assumption, raising of IA alone suffices for labelling of α whereas under Sugimoto's analysis, R needs to φ -agree with the DP in its specifier to label α . This means that if we adopt Sugimoto's analysis, labelling of α , i.e., $\{R, IA\}$, must follow the introduction of the phase head v^* to the derivation, since v^* assigns its unvalued φ features to R. In this regard, the labelling of α , under Sugimoto's proposal, is tinged with a counter-cyclic flavor, since α is labelled only after v^* , which is higher than R, is introduced to the derivation. In this respect, Sugimoto's proposal seems to be flawed, thus making Chomsky's analysis more plausible. However, Chomsky's analysis left unclear how a lexical root R can label despite the fact that it lacks its own category. In this respect, Chomsky's suggestion seems to be a mere stipulation at best.

A question arises as to which options are more plausible, and thereby should be adopted in the present thesis. Let us consider Sugimoto's analysis first. The problem with this theory noted earlier seems to be resolved when we recall that the labelling algorithm, being a case of Minimal Search (Chomsky 2015a:6), applies at phase level. Syntactic operations must follow cyclicity, meaning that they must not go back the derivation and apply there, and it seems to be reasonable to suppose that LA, though not a syntactic operation in a strict sense, also abides by this kind of cyclic property. This is because in the Merge-based derivational approach, syntactic objects are constructed in a bottom-up fashion, meaning that smaller constituents are constructed first and then larger, higher structure is built by adding constructions by merger. In this respect, it is reasonable for us to assume that labelling algorithm also applies in a similar fashion, i.e., labelling smaller constituents first and then larger ones, thereby observing

cyclicity. However, since LA applies at phasal levels, labelling of α , i.e., $\{R, IA\}$ must follow the introduction of the phase head v^* into the derivation, thereby this kind of seemingly counter-cyclic labelling being inevitable. Summarizing thus far, the labelling algorithm, being an instance of Minimal Search, is different from Merge in the timing at which it applies. Although both operations, we assume, observe cyclicity, labelling algorithm applies at the timing when a relevant phasal domain is dispatched to the CI interface (Chomsky 2013a, 2015a), labelling of structures inside the phasal domain in question follows the introduction of a relevant phase head. In this respect, the seemingly counter-cyclic labeling arises, as just noted.

If the argument just presented is on the right track, Sugimoto's analysis emerges as a more plausible approach than Chomsky's one to label a configuration of the form $\{R, XP\}$, where R is a lexical root and XP is a phrase. However, Sugimoto's analysis has two unpalatable aspects. One is that Sugimoto (2022) is silent on the matter as to why ϕ agreement of R with a DP in its specifier strengthens R enough for it to label. Its mechanism is left unexplained. Furthermore, Sugimoto's analysis is tormented with a counter-cyclic labelling, which under our assumption is desirable to be avoided. That is, since Sugimoto (2022) supposes R's ϕ -agreement with the DP in its specifier somehow strengthens R enough for it to label $\{R, IA\}$, the labelling of $\{R, IA\}$ follows the ϕ agreement of R and the DP in the specifier of R. As Chomsky (2015a, 2015b) suggests that Agree is also done by Minimal Search, the labelling of α , i.e., $\{R, IA\}$ is carried out after Minimal Search has found the matching sets of ϕ features on R and DP, which are higher than $\{R, IA\}$. If Sugimoto's analysis is on the right track, it follows that the labelling of $\{R, IA\}$ is conducted in a counter-cyclic manner; the first instance of Minimal Search finds the sets of ϕ features on the R and D and then, the second instance of Minimal Search looks deeper into the structure, finding $\{R, IA\}$ and labelling it an RP. This move, we believe, is against Chomsky's (2021) spirit of Minimal Search, the search domain of which should be minimal. Therefore, we are not able to adopt Sugimoto's analysis in the present thesis.

However, Chomsky's analysis, in which IA raising alone suffices for strengthening R, thereby R labelling $\{R, IA\}$, is, as noted above, sounds like a mere stipulation; the mechanisms behind this strengthening of R are left unexplained. Summarizing thus far, it turns out that neither Chomsky (2015a) nor Sugimoto (2022), who are to the best of my knowledge the only ones to have tackled this issue, provide a sufficient answer to the question as to how a configuration of the form $\{R, XP\}$, where R is a lexical root and XP is a phrase such as IA or v^*P . As Chomsky (2013a) states that every phrase that reaches the CI interface must receive its

label, with unlabeled structure causing the derivation to crash, we are not able to evade the issue of labelling the $\{R, IA\}$ configuration, and the same applies to labelling $\{T/R, v^*P\}$, which used to be analyzed as T' in an earlier framework. Therefore, we need to propose a plausible approach to the $\{R, XP\}$ configuration.

We assume that not the ϕ agreement, but rather the ϕ feature inheritance itself suffices for labelling the $\{R, IA\}$ configuration, meaning that the unvalued ϕ features inherited from v^* (or C in the case of T/R) serve as the label of the relevant syntactic object, i.e., $\{R, IA\}$ or $\{R/T, v^*P\}$. For the expository purpose, let us concentrate on the case of $\{R, IA\}$. In this case, once v^* enters the derivation, the v^* assigns its unvalued ϕ features to R , as mentioned earlier. As Chomsky (2013a) supposes that the labelling algorithm, in a strict sense, searches features on a head, rather than the head itself, it is reasonable to assume that these inherited ϕ features, though unvalued at this stage of the derivation, can serve as a label. Within the present theory, labelling, along with Merge, applies in a cyclic manner. Since Agree is also carried out by Minimal Search in the POP+ framework (Chomsky 2015a, 2015b), it is counter-cyclic for LA to label $\{R, IA\}$ after R and the DP in its specifier ϕ agree, as proposed in Sugimoto (2022). In contrast, under our assumption that even unvalued ϕ features can serve as labels, no counter-cyclic labelling is postulated. To make this point clearer, we consider the case of labelling $\{R, IA\}$. As noted above, once v^* enters the derivation, v^* assigns its ϕ features to R and the domain of v^* is dispatched to the CI interface, at which timing Chomsky (2015a) supposes LA applies. Under our present assumption, the first instance of Minimal Search looks into the derivation and finds the unvalued ϕ features on R and labels $\{R, IA\}$ in accordance with these features. What Chomsky (2015a) calls a root phrase turns out to be an unvalued ϕ features in our present theory. The second instance of Minimal Search then applies and finds sets of ϕ features on D and R , resulting in ϕ agreement between these elements. In this fashion, we have provided an adequate answer as to how the $\{R, XP\}$ configuration is labelled. Our analysis is somewhat more similar to the one proposed in Chomsky (2015a:10) than the one proposed in Sugimoto (2022) in that our theory does not require ϕ agreement between R and D for R to be able to label¹¹.

Note also that agreement operation between R and IA advanced in the POP+ framework explains an object-verb agreement observed in some languages. Although a verb in the English language does not exhibit any overt object-verb ϕ agreement morpheme, the POP+ framework has predicted the existence of such a phenomenon. This point is a plausible aspect of the

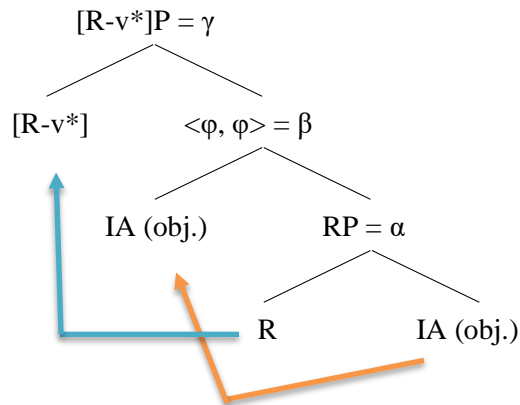
¹¹ However, our theory, though seemingly plausible, is faced with a challenge when labelling an unaccusative verbal construction, which is to be explored in the next subsection.

present framework.

Thus far, we have successfully labelled β as $\langle \varphi, \varphi \rangle$ and α as an RP in accordance with Chomsky (2015a). As the next step, Chomsky (2015a) supposes that a lexical root R raises to v^* , which is affixal in nature. If so, the derived structure will look like (13).

(13) a. $\{\gamma [R-v^*], \{\beta IA, \{\alpha R, IA\}\}\}$

b.



Since R is a lexical item, it is a head, rather than a phrase (Chomsky 2013a, 2015a, Chomsky et al. 2023). Thus, R raising is an instance of a head movement. Chomsky (2015a) assumes that since v^* is affixal, v^* is adjoined to this raised R, forming an amalgam $[R-v^*]$, which is able to label γ . Chomsky (2015a:12) suggests that v^* is Pair-Merged to the raised R (see Ke 2019, Sugimoto 2022 and Saito 2016 for the relevant discussion). According to Chomsky (2015a), v^* is invisible to LA since it is affixed to R, and R is unable to label since it has no category of its own, whereas the amalgam $[R-v^*]$ can label the entire structure γ . Therefore, as Oishi (2015) claims, what has been called v^*P turned out to be a $[R-v^*]$ Phrase and a $[R-v^*] P$ is verbal since the amalgam $[R-v^*]$ is verbal in nature (Chomsky 2015a, Oishi 2015). For the sake of simplicity, in what follows, we occasionally refer to $[R-v^*] P$ just as v^*P .

A cautionary remark is in order here. Chomsky (2021) abandons head raising operations and thereby threatens the legitimacy of the R-to- v^* raising just observed. The first reason for his elimination of head movements from legitimate syntactic operations comes from the fact that head movements have no semantic contributions to the resulting structures (Chomsky 2021). For instance, Chomsky (2021:30) states that whether V raises to T or not has no semantic impact on the attained expressions. Thus, the interpretation is the same whether the

speaker employs a V-to-T raising language such as French or a language where V stays *in-situ* (Chomsky 2021:30). As other XP movement operations are associated with discourse properties and other semantic reasons (Chomsky forthcoming), head movements are strange in that they have no semantic contributions to the outputs. Therefore, Chomsky (2021) argues that what seems to be head raising is in fact a phonological operation, amalgamating heads in the SM interface¹². Thus, he argues that head movements are to be eliminated from legitimate syntactic operations. The second reason for his dismissal of head movements is based on the MERGE framework as developed in Chomsky (2019a, 2019b, 2021). The MERGE framework is introduced to ban the illegitimate operation “Remove” entailed in the original definition of Merge (see Chomsky 1994, 1995 for the definition of Merge). Since Merge combines two syntactic objects X and Y and forms from them a new syntactic object {X, Y}, Chomsky (2019b) points out that Merge entails an illegitimate operation “Remove”. In other words, the original syntactic objects X and Y are replaced by the newly created one {X, Y}, thereby posing unpalatable problems as to from where the original syntactic objects X and Y are erased, and to where X and Y in question have gone (Chomsky 2019a, 2019b). Chomsky (2019a, 2019b) defines as a Workspace the space from which the inputs to the Merge (i.e., X and Y) were assumed to be erased, and he then continues that Merge in fact applies to the Workspace and creates a new modified Workspace called the Workspace'. This move virtually redefines Merge and he describes this newly defined operation as MERGE. Chomsky (2019a, 2019b) supposes that the initial stage of the Workspace contains all the necessary lexical items to be used to build a target phrase and MERGE, applying to the Workspace, combines two of these items (but see Chomsky 2021 and McInerney 2022 for the view where n items, where $n > 2$, can be employed as inputs to MERGE). Chomsky (2019a, 2019b) then argues that the syntactic objects used as inputs to MERGE are never lost from the Workspace, thereby ruling out the illegitimate operation “Remove”. To make the explanation more concrete, let us consider a more concrete case where the initial state of the Workspace is as described in (14). (Following Chomsky (2019a), a Workspace is denoted by using square brackets, i.e., [].)

(14) WS = [X, Y, Z]

¹² Adam Catt (p.c.) raised an important question as to the motivations for this kind of phonological operation. A likely way to answer this question is to suppose each landing site, i.e., v*, T, and C is affixal. Since an affix must be spelled out with an appropriate host, a host is raised to the affixal position and then amalgamated with the affix in question when spelled out (see Chomsky 2021). By assuming T and C are also affixal in addition to v/v*, we can derive V-to-T movement and T-to-C movement operations without increasing the theoretical burden.

Here, the Workspace contains three lexical items (i.e., X, Y, and Z) and each item is accessible to syntactic operations. Thus, the number of accessible items in the Workspace is three. When MERGE applies to the Workspace and combines X and Y, it gives rise to a modified Workspace WS' , as shown in (15).

$$(15) \quad WS' = [\{X, Y\}, Z]$$

As (15) makes clear, nothing is lost through application of MERGE, meaning that X and Y are still in the WS' and accessible to further syntactic operations (Chomsky 2019a). As MERGE has yielded a new syntactic object $\{X, Y\}$, the number of the accessible items in the WS' has increased just by one (Chomsky 2019a). In other words, the current Workspace WS' has four accessible items, i.e., X, Y, Z and $\{X, Y\}$ itself. Chomsky (2019a) states that since MERGE is a structure-building operation, it always gives rise to a new syntactic object, thereby the number of accessible items in the WS always increasing by one each time MERGE applies. This is also the case with Internal Merge (IM), though the mechanisms behind IM is somewhat different from External Merge.

Suppose that X in the WS' is Internally Merged to $\{X, Y\}$, yielding WS'' , as shown in (16).

$$(16) \quad WS'' = [\{\{X, Y\}, X\}, Z]$$

At first sight, the WS'' seems to have six accessible items, i.e., X, Y, $\{X, Y\}$, $\{\{X, Y\}, X\}$, Z, and the second occurrence of X. However, human brains, Chomsky (2019a) argues, are so slow that they are faced with Resource Restriction (RR), which severely restricts resources for further computations. More precisely, due to RR, the original instance of X (i.e., the X in its original position) is invisible to further syntactic operations, thus the number of accessible items in the WS'' being five. This is a plausible result since the accessibility of the WS'' has increased just by one from that of the WS' . The spirit of RR is somewhat similar to that of the Phase Impenetrability Condition (PIC) in that both conditions reduce the computational burden for further syntactic operations, though RR is not restricted to phasal levels. Chomsky (2019a, 2021) supposes that the human brain is not so powerful a computational system as has been assumed, and believes that some kind of restriction on resources for further computations is necessary. In this regard, RR, reducing the number of accessible items in a Workspace,

serves as a plausible candidate for such a restriction. Summarizing thus far, since MERGE is a structure-building operation, the number of accessible items in a Workspace increases by one each time MERGE applies. However, due to Resource Restriction, MERGE is not able to increase the number of accessible items in the Workspace by more than one each time it applies (Chomsky 2019a). Any syntactic operations must abide by this condition and an operation which gives rise to more than one accessible item is illegitimate within the MERGE framework.

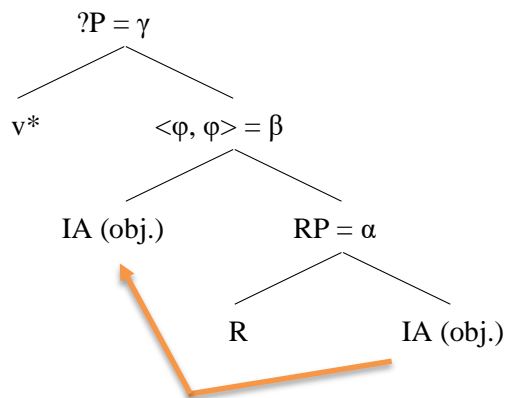
Since one of the grounds on which Chomsky (2021) rules out head movements is based on the MERGE framework, we need to consider the validity of his claim in light of the theory of the Workspace. As we have already observed, R-to- v^* raising relies on amalgamation of R with v^* . More precisely, Chomsky (2015a) suggests that v^* is pair-merged to R, which is its host. Thus, let us consider how Pair-Merge works in the MERGE framework. It turns out that this Pair-Merge analysis is to be immediately eliminated since Chomsky (2019a) states that a Pair-Merged item is always invisible to the labelling algorithm. If so, the Pair-Merged v^* is invisible to the labelling algorithm and thus it is unclear why the amalgam [R- v^*] can label the syntactic structure γ , i.e., $\{\gamma[\text{R-}v^*], \{\beta \text{ IA}, \{\alpha \text{ R}, \text{ IA}\}\}\}$. As the reason for this invisibility of a Pair-Merged item to the LA, Chomsky (2019a) supposes that Pair-Merge works in a three-dimensional way, with a Pair-Merged item being placed on a separate plane from other syntactic objects. More precisely, External and Internal Merge constructs phrases on the plane to which LA applies, whereas Pair-Merged items are always positioned on different planes, thereby always escaping from LA (Chomsky 2019a, see Chomsky 2004 for relevant discussion). For instance, a syntactic object *a red car* has a three-dimensional structure, constructed by Pair-Merging an adjective *red* to a nominal *car* and then Merging an indefinite determiner *a* to the resulting structure. Since the Pair-Merged item *red* is on a separate plane, it is always invisible to the LA and the resulting structure *red car* is always labelled as nominal in accordance with the sole visible item on the plane to which LA applies. This is the reason why an adjunct is invisible to the LA. If this analysis by Chomsky (2019a) is on the right track, the Pair-Merge analysis does not work, since the Pair-Merged v^* always escapes from LA, though within the POP+ framework, the resulting amalgam [R- v^*] is supposed to provide a label for the entire syntactic object γ , i.e., $\{\gamma[\text{R-}v^*], \{\beta \text{ IA}, \{\alpha \text{ R}, \text{ IA}\}\}\}$. On this ground, the Pair-Merge analysis suggested in Chomsky (2015a) is to be dispensed with. Since the POP+ framework relies on Pair-Merge of v^* to R, we need to find some ways to label a verb phrase $\{\gamma[\text{R-}v^*], \{\beta \text{ IA}, \{\alpha \text{ R}, \text{ IA}\}\}\}$.

Let us consider another possibility. What if the amalgam [R- v^*] is built by simple head

raising, rather than Pair-Merge? We mean by “simple head raising” that we do not resort to Pair-Merge to label the relevant verbal phrase. As has been discussed, Chomsky (2015a) supposes that R raises to v^* , and v^* is adjoined to R, creating an amalgam $[R-v^*]$, which labels the entire syntactic object (i.e., $\{\gamma [R-v^*], \{\beta IA, \{\alpha R, IA\}\}\}$). Is it possible that we can build the amalgam without resorting to Pair-Merge? A question arises here as to whether or not this amalgamation analysis is compatible with the MERGE framework discussed above. The Workspace before the R-to- v^* raising applies is shown below as (17), basically repeated from (12).

(17) a. $WS = [\{\gamma v^*, \{\beta IA, \{\alpha R, IA\}\}\}]$

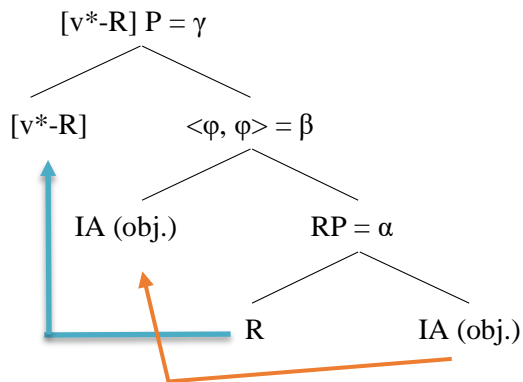
b.



MERGE then applies to the current Workspace and is supposed to give rise to the new Workspace (denoted as $Workspace'$), as shown in (18), basically repeated from (13).

(18) a. $WS' = [\{\gamma [R-v^*], \{\beta IA, \{\alpha R, IA\}\}\}]$

b.



The resulting WS' seems to violate the definition of MERGE, since the raised R is incorporated into the existent syntactic object γ , rather than creating a new syntactic object. The sole syntactic object which can be argued to have been created in this operation is the amalgam [R-v*], which poses an accessibility problem. Since [R-v*] is an amalgam, whether it counts as one accessible item or two is unclear. If the amalgam in question is counted as one accessible item, the number of accessible items in the WS' in (18) is five or six. That is, R; {R, IA}; IA; {IA, {R, IA}}; {[R-v*], {IA, {R, IA}}}; and the amalgam [R-v*] itself. If the original instance of R is invisible to further syntactic operations due to the Resource Restriction, the number of accessible items is five. If not, the number of accessible items is six. Since head movement applies in a successive cyclic fashion, it seems to be reasonable to assume that the original instance of R is invisible to further computation. If so, the number of accessible items is five.

The number of accessible items in the original Workspace in (17) is six. That is, R; {R, IA}; IA; {IA, {R, IA}}; v*; {v*, {IA, {R, IA}}}. Since the number of accessible items in the WS' is at most six, the observation thus far tells us that MERGE has not increased the number of accessible items in a Workspace. This result is obviously implausible since MERGE must always increase the number of accessible items by one, since MERGE is a structure building operation (Chomsky 2019a). If we consider the amalgam [R-v*] to have two accessible items inside it, the problem may be resolved. However, we are not able to resort to such a measure, the reason for which is based on the properties of head movements. In a V-to-T raising language such as French, the verbal head is raised to T along with the affix originating in v/v* (Radford 2016, Roberts 2021). Furthermore, in V2 languages such as German, a V in a main clause raises onto the C position along with the verbal and tense affixes originating in v/v* and T, respectively. In the course of this movement operation, no affix is left in its intermediate landing sites (Roberts 2021). These empirical data suggest that the amalgam [R-v*] should be counted as a unit, rather than as separate items. Therefore, we cannot extract R alone, stranding affixes in the intermediate landing sites. If this observation is correct, it follows that the accessibility issues remain; even after MERGE applies, the number of accessible items does not increase, in violation of the definition of MERGE proposed in Chomsky (2019a).

Summarizing thus far, the POP+ framework, when labelling a verbal phrase, resorts to the amalgamation of a verbal affix v* and a lexical root R, though this move turns out to be theoretically implausible on two grounds. First, when we follow Chomsky's (2015a) suggestion and take v* to be Pair-Merged to the lexical root R, we are faced with a theoretical

contradiction. That is, although Chomsky (2019a) states that a Pair-Merged item (the verbal affix v^* in this case) is placed on a separate plane from other constituents and thereby is always invisible to the labelling algorithm, Chomsky (2015a) takes the amalgam $[R-v^*]$ to label a verbal phrase, leading to a theoretical contradiction. If v^* is really Pair-Merged to R , v^* must be on a separate plane from the one the labelling algorithm searches, and thereby invisible to LA. If so, Chomsky's (2015a) approach leaves unclear how the resulting amalgam $[R-v^*]$ serves as the label of the entire verbal phrase, since v^* is invisible to the LA. Second, even when we put aside the issue regarding Pair-Merge, the MERGE framework prohibits Chomsky's (2015a) amalgamation approach; if we do not resort to Pair-Merge of v^* to R , the number of accessible items in the Workspace does not increase even after MERGE has applied, in violation of the definition of MERGE. In these regards, Chomsky (2021), we assume, abandons head movements and claims that what seems to be a head movement is in fact a phonological operation, meaning that heads are amalgamated in the SM interface by the operation AMALGAMATE (Chomsky 2021:36). However, we are not satisfied with this move.

One reason we are not satisfied with Chomsky's claim is that the amalgam $[R-v^*]$ can serve as the label of the entire verbal phrase, as just noted. Since the amalgam $[R-v^*]$ can label the syntactic object, it is obvious that the amalgam in question is a legitimate syntactic object, rather than a phonologically amalgamated structure as claimed in Chomsky (2021:36). If Chomsky's (2021) claim is correct and R raising is consigned to a phonological operation, the amalgam $[R-v^*]$ must not label. Since a phonological operation takes place at the SM interface, it is available only after the syntactic structure has reached the SM interface, which follows the Transfer of the current syntactic object to the CI interface, where labels are necessary for interpretation. Recall that there have been some suggestions that the definition of phase should be modified and we have adopted the recent one proposed in Chomsky et al. (2019), where the relevant phasal domain is dispatched to the CI interface each time a phase is completed, whereas Transfer to the SM interface takes place only after the highest phase in the relevant derivation (i.e., the CP phase in the matrix clause) has been constructed, meaning that Transfer to the SM interface takes place in one fell swoop (see also Sugimoto 2022 for the relevant discussion). If so, any phonological operation including AMALGAMATE proposed in Chomsky (2021) must follow Transfer to the CI interface of the relevant syntactic object. This is an implausible move since although labels are necessary in the CI interface for interpretations, within the modified approach to the phase put forth in Chomsky et al. (2019), the amalgam $[R-v^*]$, being a phonologically amalgamated structure, has not yet been

constructed as the relevant syntactic structure has not yet reached the SM interface. Thus, if we take at the face value Chomsky’s (2021) claim that head movements are phonological operations, rather than syntactic ones, it follows that the verb phrase in question cannot receive a label at an appropriate stage of the derivation, causing the derivation to crash. Recall that this asymmetric Transfer relies on asymmetries between the SM and CI interfaces noted by Chomsky (2019a, 2019b) and Chomsky et al. (2019), among others. They argue that the human language faculty (Faculty of Language; FL) only yields representation for the CI interface and the SM interface is in a strict sense outside the system of language, which they believe is a system of thought. This suggestion seems to be a sound one in light of (9), repeated here as (19), in which the TP *Tom Jones is guilty* in β is not able to be stranded in (α) .

(19) [α the verdict [β that Tom Jones is guilty]] seems to have been reached (α) by the jury.

(Chomsky et al. 2019: 140 (19))

In this regard, Chomsky et al.’s (2019) claim that there is an asymmetry between the timings of Transfer to each interface seems to be a sound one, thereby posing a problem for Chomsky’s (2021) claim that what seems to be a case of head movement is in fact a phonological merger. Thus, we need to claim that at least the amalgamation of R and v^* is a legitimate syntactic operation, rather than a phonological operation as claimed in Chomsky (2021), since the resulting amalgam [R- v^*] alone among other structures which result from so-called head movements serves as a label for the relevant syntactic structure. Although as we have noted earlier, both the Pair-Merge and the direct amalgamation approaches to the structure [R- v^*] is flawed, we have no choice but to adopt the amalgamation of R and v^* , since we have no alternative approaches.

We return to the current derivation, in which the verbal phrase $\{\gamma$ [R- v^*], $\{\beta$ IA, $\{\alpha$ R, IA $\}\}$ has been constructed and successfully labelled. The attained [R- v^*] P is then merged with an External Argument EA, resulting in (20).

(20) $\{\delta$ EA, $\{\gamma$ [v^* -R], $\{\beta$ IA, $\{\alpha$ R, IA $\}\}\}$

Since δ is of the form $\{XP, YP\}$ it is faced with a familiar labeling issue, which is resolved by raising the External Argument EA to the spec-TP position, as has been already

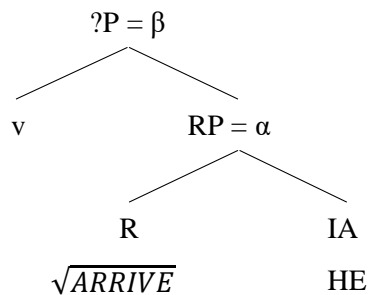
observed. In this fashion, δ is labelled as $[v^*-R] P$ and the whole verbal phrase including the EA has been successfully derived.

2.4 The derivation of vP

This section deals with the derivation of vP. Recall that vP is associated with unaccusative and passive constructions both of which lack agentive External Arguments, which originate in the specifiers of the verbalizers (v) (Chomsky 2005, 2007, 2008, among others). With this in mind, let us consider the derivation of an unaccusative verbal phrase *he arrived early*.

Although Chomsky (2015a) does not elaborate on the derivation of an unaccusative construction, we take the first step of the derivation to be merger of a lexical root R and the Internal Argument IA. If so, this merger yields a syntactic object $\{R, IA\}$ and the resulting structure $\{R, IA\}$ is then Merged with v, yielding $\{\beta v, \{\alpha R, IA\}\}$, as shown in (21) below. In the present case, we do not assume that the Internal Argument raises to the “specifier” of R. We return later to the reason for this assumption.

- (21) a. $\{\beta v, \{\alpha R, IA\}\}$ (e.g. arrive HE)
 b. $\{\beta v, \{\alpha \sqrt{ARRIVE}, HE\}\}$
 c.



(21b) shows the structure with actual lexical items. The capitalized HE is employed to mean that HE has not received its case yet. The notation $\sqrt{\quad}$ is adopted from Marantz (1997) to denote a category neutral lexical root.

At this stage of the derivation, we are faced with a serious problem: whether v is a phasal head or not is unclear. Recall that a phase head is a locus of unvalued features (Chomsky 2015a:5). This means that unvalued ϕ features originate on a phase head and are then inherited by the lexical root R selected by the phasal head in question (Chomsky 2007, 2008, 2015a). In the POP+ framework, as we have already seen, the inherited unvalued ϕ

features are ultimately valued by interpretable ϕ features on the constituent in the “specifier” of R (Chomsky 2015a). This is what we call agreement (Chomsky 2000 *et seq.*). Thus, whether or not v is a phase head and thus equipped with a set of unvalued ϕ features to assign to the lexical root R is a crucial matter.

We assume with Chomsky (2007, 2008, among others) that v is not a phase head, thus not a locus of unvalued features. This means that v lacks unvalued ϕ features to assign to the lexical root taken by it. In the earlier minimalist framework, Chomsky (2001) analyzes an unaccusative verb as lacking ϕ features, thus it being unable to assign an accusative case to its complement DP. If we apply this analysis to the current framework of the v -R feature transmissions, we can conclude that v has no ϕ features to assign to the lexical root R, thus confirming the claim made by Chomsky (2007, 2008, among others) that vP is not a phase. If so, we can predict that the lexical root R in (21) does not agree with the Internal Argument *HE*, and is thus unable to assign the Internal Argument in question an accusative case. This is the reason why we have not assumed that the Internal Argument IA raises to the “specifier” of R.

We are then faced with a labelling issue: how do we label α , i.e., {R, IA}? Since the lexical root R does not inherit a set of unvalued ϕ features from v , we are not able to label α $\langle\phi, \phi\rangle$. Since the current derivation has not reached a phase level, labels are not necessary at the current stage of the derivation, though ultimately, labels are necessary since every phrase generated thus far ends in reaching the CI interface, where labels are necessary for the interpretation. Therefore, we need to address the issue on the labelling of α , i.e., {R, IA}. In the present case, Chomsky’s (2015a:10) approach, where IA raising strengthens the R enough for it to label, does not work, since IA does not raise to the specifier of R in our present analysis of an unaccusative construction. Neither does Sugimoto’s analysis, in which the ϕ agreement between R and IA is argued to strengthen R and as a consequence, R serves as a label. The analysis we presented in the previous section, where unvalued ϕ features inherited from a phase head serve as a label does not work either, since in the present case, v does not have ϕ features to assign to R, as noted earlier. Therefore, we have no way to label α , i.e., {R, IA}, in the present case.

Since every phrase reaching the CI interface needs a label, as already noted, the present state is obviously implausible. The {R, IA} configuration must receive its label, though how to label this configuration is unclear. The sole way we come up with to label {R, IA} here is to adopt Chomsky’s (2021:36) suggestion that tense is not a property of T but rather that of v/v^* . To the grounds this analysis rests on, we return later. If the tense feature

resides on the *v*, rather than on the T head, as Chomsky (2021) supposes, it follows that the tense feature on the *v* is then dispatched to the lexical root R, and the {R, IA} configuration is labelled in accordance with that tense feature. The present analysis raises two questions: (i) whether or not an interpretable feature can be transferred from a phase head to the head it takes, and (ii) *v*, which is **not** a phase head in our present supposition, is able to assign its features to R. On the first question, recall that in the case of *v*^{*}, it is a set of unvalued, thus uninterpretable, ϕ features that is assigned by the phase head *v*^{*} to the lower head R. Since the tense feature is obviously an interpretable feature, as opposed to an uninterpretable feature, our analysis, in which the tense feature is assignment to R, poses a theoretical problem. Is an interpretable feature dispatched to another head? Here, the distinction between an interpretable and uninterpretable feature is based on whether the value of that feature is determined while the lexical item which serves as the locus of that feature is stored in the Lexicon (Chomsky 2000 *et seq.*). According to Chomsky (2004, 2008), a tense feature in the C-T system and ϕ features on a nominal phrase count as valued, interpretable features, whereas a structurally determined case on a nominal, referred to as a structural case in the literature, and ϕ features on the C-T system belong to unvalued, uninterpretable features. For illustration, consider the sentence below.

(22) He reads this book every day.

In (22), the nominal phrase *he* in the surface subject position receives its nominative case through agreement with T, meaning that the case on the nominal *HE* was not determined while *HE* was stored in the Lexicon. In other words, *HE* is assigned its nominative case due to the structural position in which it is placed, i.e., the specifier of T in the present case. In this regard, a nominative and accusative case on a nominal phrase is referred to as a structural case in the literature (e.g., Chomsky 2004, 2008), and a structural case on a nominal phrase is considered to be an unvalued, uninterpretable feature; its value is assigned contextually (Chomsky 2004, 2008). The same holds for the ϕ features on the C-T system. In (22), the ϕ features on the T, transferred from C, materializes as *-s*, meaning that the ϕ features in question have the value as third-person singular. However, these values are assigned via agreement with *HE* in the specifier of T, meaning that the values of the ϕ features on the C-T system were unsettled while the C is stored in the lexicon (Chomsky 2007, 2008). In this regard, ϕ features on the C-T system are unvalued, uninterpretable features (*ibid.*). These feature on the C-T have no semantic consequence and their values are

determined via agreement with the corresponding features on a nominal in the specifier of T (Chomsky 2000 *et seq.*). On the other hand, the ϕ features on *HE* has fixed values regardless of the structural position in which it is placed; whether *HE* serves as an object or subject of a transitive verbal construction, *HE* is interpreted as third-person singular. Therefore, Chomsky (2000 *et seq.*) believes that ϕ features on a nominal have their fixed values while the nominal in question is stored in the Lexicon, and he calls such features valued, interpretable features. Chomsky (2008) supposes that the same applies to the tense feature on the C-T system, meaning that its value is fixed regardless of the context in which it is placed. Therefore, its value is determined while the C is in the Lexicon, meaning that the tense feature on the C-T is a valued interpretable feature. As we have noted above, the tense feature turns out to originate on a v/v^* head (Chomsky 2021), and we have assumed that the tense feature on v is assigned to the lexical root R the v immediately takes. Recall the question we are here faced with is whether a tense feature, being a valued interpretable feature, is able to be dispatched to the lower head. We assume that v is able to assign its tense feature to R, since the same kind of feature inheritance is observed in the C-T system. In the earlier framework adopted in Chomsky (2007, 2008, 2013a, 2015a), C assigns to T its valued interpretable tense feature along with its unvalued uninterpretable ϕ features. Thus, there is no theoretical barrier to the tense feature assignment postulated in the present framework.

The second issue we need to address is whether or not v , not being a phase head, is able to assign its feature(s) to R it takes. Feature inheritance is characteristic of occurring between a phase head and the head taken by it. If so, a question arises as to whether it is legitimate to extend this analysis to a non-phase head v . We suggest that it is possible for a non-phase head like v to assign its feature to R it takes, since there is a strong bond between v and R. As we will see below, v and R are to be amalgamated in the course of the derivation, forming an amalgam [R- v], which labels the entire verbal phrase. This strong tie between v and R makes it possible for v to assign its tense feature to R, and the inherited tense feature, we assume, serves as the label of the {R, IA} configuration here. However, note that the presented analysis is in mild violation of the Markovian properties of derivations. According to Chomsky (2021) and Chomsky et al. (2023), derivations are Markovian, meaning that the present state of a derivation has no access to its history or future. In other words, the current state of the derivation has no idea how it has been constructed or what will happen to it (Chomsky 2021, Chomsky et al. 2023). If so, our analysis just outlined violates this condition on derivation, since in order for v to assign its

tense feature, the current stage of the derivation must be aware of the next step in the derivation. However, as we have no alternative approach to label α , i.e., {R, IA} in an unaccusative verbal construction, we have no choice but to put aside this serious drawback with our analysis.

Thus far, we have put aside Chomsky's (2021) grounds for analysing a tense feature as originating on v/v^* , rather than C. Here we evaluate the validity of his argument. Chomsky (2021), citing the examples below, argues that the two conjuncts in (23) share tense, though (24) reveals that tense is not necessarily shared by two conjuncts.

(23) John arrived and met Bill. (Chomsky 2021:33)

(24) John arrives every day at noon and met Bill yesterday. (Chomsky 2013:34)

Chomsky (2021) analyzes the example in (23) as having the following internal structure.

(25) INFL, {&, {{₁ v, {arrive, John₁}}, {₂ John₂, {v*, {meet, Bill}}}}}
 (Chomsky 2021:33)

According to him, (25) is derived as follows; successive External Merge constructs conjuncts 1 and 2, putting aside IA raising in conjunct 1 and R raisings in both conjuncts 1 and 2 for an expository purpose. The resulting structures, Chomsky (2021) argues, are then Merged to form a set “{{₁ v, {arrive, John₁}}, {₂ John₂, {v*, {meet, Bill}}}}” (p.33). To this structure, he supposes, the coordinator & is introduced, yielding the structure below.

(26) {&, {{₁ v, {arrive, John₁}}, {₂ John₂, {v*, {meet, Bill}}}}}

Notice that the resulting structure is of the form {&, Y₁, Y₂}, a ternary structure. A ternary structure seems to be against the spirit of the minimalist syntax, where linguistic structures are constructed by a binary set formation, Merge (Chomsky 1994, 1995). Furthermore, one may wonder why the coordinator & is placed at the initial position of the coordination structure, since in the English language, it is not spelled out in such a position. A straightforward answer to the second question is immediately provided; since Merge yields an unordered set, {X, Y} is equal to {Y, X}, as Chomsky et al. (2019) argue. If so, then {&, Y₁, Y₂} = {Y₁, &, Y₂} = {Y₁, Y₂, &} and so on. On the other hand, the first

question requires a more intricate answer. The n-array structure (where n is larger than 2) is due to a property of the operation Form Sequence, which Chomsky (2021:31) postulates to capture properties of coordinate structures. Suppose we are building a coordinate structure where X_1, X_2, \dots, X_m are coordinated. In such a case, Chomsky (2021) argues that Form Sequence selects on the Workspace all the members to be coordinated, i.e., $X_1, X_2, X_3, \dots, X_m$ and the coordinator & itself, forming a structure of the form $\langle \&, X_1, \dots, X_m \rangle$. According to him, the coordinator & is spelled out in one position or another, depending on the externalization rule of a particular language (Chomsky 2021:31). In the case of the English language, the coordinator & is typically spelled out immediately before X_m , though that is not necessarily so. Notice that the sequence constructed has a flat structure, suggesting that the members of the sequence have no c-commanding/c-commanded relation as pointed out by McInnerney (2022). Within the framework of Form Sequence just outlined, a coordinate structure where m items are coordinated, has an $m + 1$ array structure. Therefore, in a coordinate structure, an n-array structure, where n is larger than 2, arises. As I could not grasp the argument of Chomsky (2021), it is unclear to me whether Form Sequence is a structure-building operation having an equal status with Merge. If so, an n-array structure, where n is larger than 2, is justified and the first question we have raised is resolved; a ternary structure is acceptable in a coordination structure.

Let us return to the derivation of (23) *John arrived and met Bill*. Thus far, we have constructed a coordination structure. The next step of the derivation, Chomsky (2021) supposes, introduces INFL to the attained structure in (26), yielding the structure shown in (25), repeated here as (27).

(27) INFL, {&, {{₁ v, {arrive, John₁}}, {₂ John₂, {v*, {meet, Bill}}}}}

(Chomsky 2021:33)

He argues that either *John₁* or *John₂* raises to the spec of INFL, and the one remaining in its original position is silenced in the SM interface. The resulting structure is then sent to the CI and SM interface. In the SM interface, the operation Amalgamate applies, where the lexical root, v/v* and INFL is spelled out in an amalgamated form [R-v-INFL]. In the present case, $[\sqrt{ARRIVE}\text{-v-INFL}]$ is spelled out as *arrived*, and $[\sqrt{MEET}\text{-v*-INFL}]$ as *met*, both of them sharing the tense. However, in the case of (24), repeated here as (28), it is not the case.

(28) John arrives every day at noon and met Bill yesterday. (Chomsky 2013:34)

The example in (28) is analyzed as having basically the same internal structure as (27), repeated here as (29). (For clarity, we skip the vP adjuncts *every day at noon* and *yesterday*, which are Pair-Merged to the verb phrases.)

(29) INFL, {&, {{₁ v, {arrive, John₁}}, {₂ John₂, {v*, {meet, Bill}}}}}

(Chomsky 2021:33)

The next step of the derivation is the same as its counterpart just outlined, i.e., raising either *John₁* or *John₂* to the Spec-INFL position, phonologically deleting the one remaining in its original position. The attained structure is then dispatched to the SM interface, where the operation Amalgamate applies, in which the lexical root R, v/v*, and INFL are phonologically amalgamated. In the present case, the phonologically amalgamated phrase [\sqrt{ARRIVE} -v-INFL] is spelled out as *arrives*, whereas [\sqrt{MEET} -v*-INFL] is spelled out as *met*. This is a surprising result since (29) explicitly shows that both verbal phrases share the same INFL. It follows that INFL, which has long been assumed to be the locus of tense, turns out to be a bundle of mere ϕ feature inflections (Chomsky 2021). In this regard, Chomsky (2021) claims that tense does not reside on the C-T system, but on the verbal functional category v/v*.

A likely objection to the analysis just presented is that (28) does not have the internal structure shown in (29), but rather has the internal structure shown below.

(30) {&, {{₁ INFL, {v, {arrive, John₁}}}, {₂ INFL, {John₂, {v*, {meet, Bill}}}}}}}

In the analysis presented in (30), two INFL phrases are conjoined. In this fashion, the two verbal phrases have two different INFLs, thus seemingly nullifying Chomsky's (2021) analysis just outlined. However, the analysis presented in (30) yields the below structure, a simple coordination of INFLPs. (Struck-through items are silenced in the SM interface.)

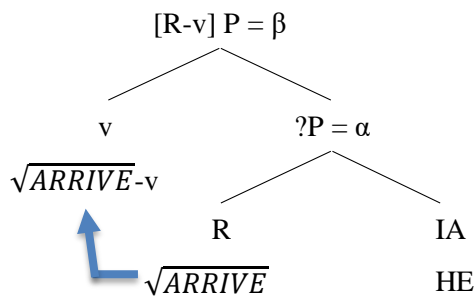
(31) a. {&, {{₁ John₁, {INFL, {v, {arrive, ~~John₁~~}}}, {₂ John₂, {INFL, {~~John₂~~, {v*, {meet, Bill}}}}}}}}}

b. John arrives (early every day at noon) and John met Bill (yesterday).

This is because *John*₂ is not able to raise out of the conjunct 2. If *John*₂ moves out of the conjunct 2, the INFL in conjunct 2 has no specifier to ϕ agree with, thereby causing the derivation to crash. Therefore, if we are to attain (28), we must adopt Chomsky’s analysis, where the two verbal phrases share the same INFL. Thus, Chomsky’s (2021) claim that the tense resides on v/v^* seems to be a sound one. If so, the analyses we have made thus far should be recast in accordance with this finding. We have followed Chomsky (2007, 2008), arguing that C assigns its tense feature and ϕ features to T, and v^* dispatches its ϕ features to R. However, in light of the present analysis, where v/v^* is the locus of tense feature, we need to analyze C as assigning its ϕ features alone to T. v is more intricate than C since verbal functional categories come in two flavors: v and v^* . In the case of v^* , it assigns to R its ϕ features, along with its tense feature, whereas in the case of v , it assigns its tense feature alone to R.

Let us return to the derivation of a vP . Recall that thus far we have derived $\{v, \{R, IA\}$ and labelled $\{R, IA\}$ in accordance with the tense feature on R, which is assumed to be the sole prominent feature on R. The next step of the derivation, we assume, raises R to v , forming an amalgam $[R-v]$, as shown in (32) below. Notice that this R raising operation mirrors that in v^*P . As the reason for this R raising, we suppose that v , along with v^* , is also affixal in nature, and since an affix is spelled out with its host, R must be raised to v ¹³.

- (32) a. $\{\beta [R-v], \{\alpha R, IA\}\}$ (e.g. arrived HE)
 b. $\{\beta [\sqrt{ARRIVE}-v] \{\alpha \sqrt{ARRIVE}, HE\}\}$
 c.



¹³ As the reason for supposing R raising is a syntactic operation, rather than a phonological one, see the previous subsection, where we have advanced a counterargument to Chomsky (2021)

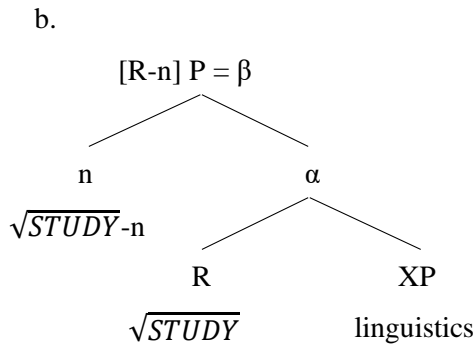
The [R-v] amalgam is able to label β , and β is labelled [R-v] P, in line with Chomsky’s (2015a) analysis of v*P. The resulting syntactic object is then merged with T/R, forming $\{\gamma T, \{\beta [R-v], \{\alpha R, IA\}\}\}$. At this stage of the derivation, the Internal Argument *HE* raises to the “specifier” of T/R, yielding $\{\delta IA, \{\gamma T, \{\beta [R-v], \{\alpha R, IA\}\}\}$, and C then merges with δ , passing its unvalued ϕ features to T/R. The unvalued ϕ on the T/R is then valued as third person singular in accordance with the values of the interpretable ϕ on the Internal Argument *HE* in the spec-T/R and the Internal Argument *HE* receives the nominative case (Chomsky 2000, 2001, 2004). A trivial question remains regarding at which timing and where the adverb *early* is merged, though we do not delve into this issue by assuming *early* to be a VP or vP adjunct, just Pair-Merged with the relevant structure. In this fashion, we have successfully derived and labelled the entire CP *he arrived early*.

2.5 Chomsky’s original approaches to nominals (Chomsky 2007)

In light of the derivations of v*P and vP just discussed, this section considers the derivation of nominal phrases. In his original analysis, Chomsky (2007) states that nominals are classified into two types: nP and n*P, with nP being a notation for indefinite nominal phrases and n*P for definite ones (Chomsky 2007).

Based on the original claim proposed in Chomsky (2007), an indefinite nominal phrase such as *students of linguistics* is derived as follows. If the nominal phrase has its complement, as in this case (i.e., *the student of linguistics*), Chomsky (2007) supposes that the first step in the derivation is merger of a category neutral lexical root R and its complement (XP), forming a syntactic object {R, XP}. In the present case, the resulting structure {R, XP} will look like $\{\sqrt{STUDY}, \text{linguistics}\}$. This structure is then Merged with a nominalizer n, forming a configuration of the form $\{n, \{R, XP\}\}$. Chomsky (2007) further supposes that the lexical root R raises to the n position, in a fashion analogous to R raising observed in vP. Although Chomsky (2007) does not state this much, this R raising, if applied to the POP+ framework, creates an amalgam [R-n], which can label the entire syntactic object (see Chomsky 2015a). To summarize, (33) shows the internal structure of the resulting nominal phrase *students of linguistics*.

(33) a. $\{\beta [R-n], \{\alpha R, XP\}\}$



Since the resulting syntactic object is nominal, the XP *linguistics* materializes as *of linguistics* (Chomsky 2004). This is because although n/n* in English are unable to assign cases, nominals require cases to be spelled out (Case Filters in Chomsky 1980:25, 1981:49, which stipulates that a phonetically realized nominal phrase must bear its case). Furthermore, the amalgam [$\sqrt{\text{Study}}$ -n] materializes as *student*, though we put aside possible counterarguments that the amalgam in question can also materialize as *studying* or *study*, both of which can be argued to be nominal. Furthermore, we assume that the plural morpheme *-s* is attached to the amalgam [R-n], an assumption which is partially due to Chomsky's (2007) claim that n/n* bears a case. Since the amalgam [R-n] is the label of the entire phrase within the POP+ framework, we can also take this amalgam to be the locus of case morphemes. If so, it is reasonable to suppose that the [R-n] amalgam is the locus of the plural morpheme *-s* as well.

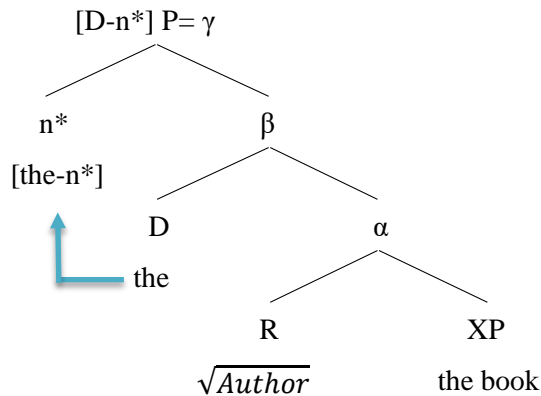
In cases where a nominal phrase lacks its complement, as in *cats*, the first step of the derivation, we assume, is merger of n and R. Subsequent steps of the derivation are essentially the same as that of nP with its complement (e.g., *students of linguistics*).

According to Chomsky's (2007) original proposal, definite nominals such as *the dogs* and *the author of the book* are categorized as n*Ps, the derivations of which proceed as follows. In cases where the nominal phrase has its complement, as in the case of *the author of the book*, the first step of the derivation is to Merge the lexical root R and its complement XP, yielding a syntactic object $\{\alpha R, XP\}$. In the case of *the author of the book*, the structure attained so far will look like $\{\sqrt{\text{AUTHOR}}, \text{the book}\}$. Within the framework presented in Chomsky (2007), this structure is then Merged with the definite determiner *the*, forming $\{\beta D, \{\alpha R, XP\}\}$. At this stage of the derivation, the nominalizer (n*) enters the derivation, yielding $\{\gamma n^*, \{\beta D, \{\alpha R, XP\}\}\}$. Chomsky (2007) supposes that the nominal feature on the n* percolates onto the D and the D head then raises to the position of n, in a fashion analogous to R raising observed in v*P/vP. If applied to the POP+ framework, the raised D must

amalgamate with n^* , forming an amalgam $[D-n^*]$, which labels the entire syntactic object γ . In this manner, we have derived the whole $[D-n^*] P$. The complement of the R materializes as *of books* as in the case of nP *students of linguistics* (see Chomsky 2004). To summarize, the derivation of n^*P is shown in (24).

(34) a. $\{\gamma [D-n^*], \{\beta D, \{\alpha R, XP\}\}\}$

b.



In the case of n^*P with no complement, as in *the dog*, the initial step of the derivation will be Merge of D and R, and the derivation then proceeds in the same fashion as that of n^*P with a complement.

Chomsky's (2007) original analysis has some shortcomings. One is that his analysis engenders an asymmetry between n^*P and nP; in the case of nP, what raises to the n position is the lexical root R, whereas in the case of n^*P , what raises to n^* is the determiner D, rather than the lexical root R. If applied to the present POP+ framework, this asymmetry means that although R can amalgamate with n in the case of nP, it cannot amalgamate with n^* in the case of n^*P . Therefore, a category neutral lexical root R behaves completely differently depending on whether it is in an nP or n^*P . This asymmetry between nP and n^*P is obviously implausible and hence should be dispensed with.

Furthermore, D raising in the case of n^*P poses an unwanted problem regarding head movements. There is a consensus in the literature that only a head can move into another head position (see e.g., Roberts 2010:1) and the D raising observed in n^*P is problematic for this reason. Chomsky et al. (2019), adopting Leu's (2015) analysis, point out that D is possibly a morphologically complex element, meaning that what we call D may not consist of a simple lexical head, but rather be constructed by merger of several smaller elements. If so, it follows that D does not qualify as a head, since it is constructed by merger of smaller items. For

instance, Leu (2015), investigating German, Swiss German and several other languages, concludes that *jeder* ‘every’ can be decomposed into *je-d-er*. If so, it is not unreasonable to extend this analysis to the determiners in English and analyze them as complex elements. If this line of argument is on the right track, D raising observed in n*P turns out to be theoretically implausible since a phrase, rather than a head, moves into another head position n*. For these two reasons, we cannot adopt Chomsky’s (2007) original analysis of nP/n*P.

However, we should adopt the spirit of Chomsky’s (2007) original claim. What he has to say is that (i) semantically, a nominal phrase is nominal, rather than a determiner phrase, and (ii) the derivations of a nominal phrase mirrors that of a verbal phrase, implying that the sole difference between these two phrases is whether n/v is employed as a categorizer. This claim is plausible on theoretical grounds, since as we have already seen, nominalized forms lack layers which correspond to T layers in CP. Thus, nominals lack such layers¹⁴. Therefore, we must not abandon Chomsky’s insight even though his original analysis is flawed to some degree. In what follows, we reconsider the internal structures of nominals in light of the POP/POP+ frameworks.

2.6 The nP hypothesis revisited

This section reconsiders the internal structure of nominals in light of the analysis made in sections 2.3 and 2.4. In the present section, we distinguish nominals with complements from ones without complements. Here we depart from Chomsky’s (2007) notations and employ n* for nominals with complements and n for nominals without complements to make clear the symmetry between nominals and verbal phrases.

2.6.1 The derivation of n*P

Let us consider the derivation of n*P, the internal structure of which must mirror that of v*P. To illustrate, the present section delves into the derivation of the n*P *the destruction of the city*, the derivational first step of which will be merger of the lexical root $\sqrt{DESTROY}$ and the internal argument *the city*.

(35) a. $\{ {}_aR, IA \}$

¹⁴ Yuki Kawabata (p.c.) points out that nominals in some languages have inherent tense properties, bringing Lecarme (2004, 2012) to my mind. This phenomenon, referred to as nominal tense in the literature (e.g., Lecarme 2004, 2012), is to be put aside here, since this kind of phenomenon is not a crosslinguistic phenomenon (i.e., nominal tense is not observed in a variety of languages across the world).

b. $\{\alpha \sqrt{DESTROY}, \text{the city}\}$

(35a) shows the schematic structure of the current derivation and (35b) shows the structure with the actual lexical items. Following the derivation of the v*P discussed in section 2.3, the internal argument raises to the “specifier” of the root, deriving the structure shown in (36), with (36a) showing schematic form and (36b) showing structure with the actual lexical items.

(36) a. $\{\beta \text{IA}, \{\alpha \text{R}, \text{IA}\}\}$

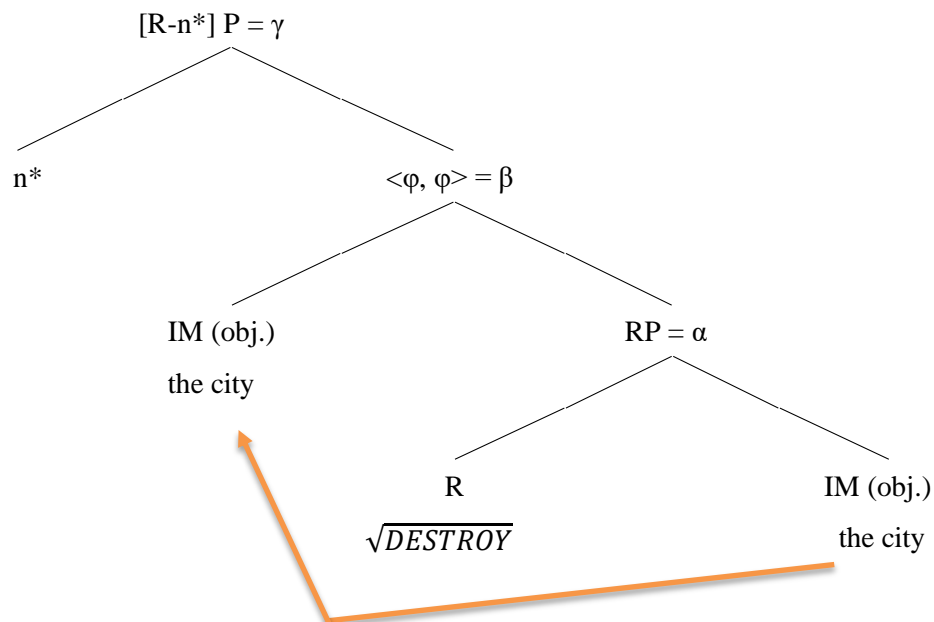
b. $\{\beta \text{the city}, \{\alpha \sqrt{DESTROY}, \text{the city}\}\}$

The resulting structure is then Merged with n*, forming the structure shown in (37).

(37) a. $\{\gamma \text{n}^*, \{\beta \text{IA}, \{\alpha \text{R}, \text{IA}\}\}\}$

b. $\{\gamma \text{n}^*, \{\beta \text{the city}, \{\alpha \sqrt{DESTROY}, \text{the city}\}\}\}$

c.



Recall Chomsky’s assumption that nP is a phase (Chomsky 2021). If so, it follows that the derivation has reached the phasal level here. Thus, in accordance with the Phase Impenetrability Condition, the domain of the phase head n* is dispatched to the CI interface

for interpretation, necessitating labels. If the derivations of n*P parallels that of v*P, as Chomsky (2007) assumes, then the phase head n* should pass its unvalued ϕ features to the lexical root R. Although Oishi (2015), who delves into the nP hypothesis, is silent on this matter, we should consider R to inherit unvalued ϕ features from n*, if we are to argue, following Chomsky (2021), that n*P is a phase. The main reason for this analysis is that all phase heads assign their unvalued ϕ features to the heads (or more precisely to Rs) selected by these phasal heads (Chomsky 2007). If n* were the sole exception to this generalization, a question would arise how a child learning the grammar of a particular language handles nominal constructions. In this respect, we suppose that the lexical root R inherits unvalued ϕ features from n*, which we assume is a phasal head.

If this line of argument is on the right track, β in (37) will be labelled $\langle \phi, \phi \rangle$, in line with the labelling of {IA, {R, IA}} in v*P discussed earlier (see also Chomsky 2015a). The theoretical implication of this reasoning is that we have predicted some kind of agreement between the lexical root R and its complement. This means that in the present case, the root $\sqrt{\text{destroy}}$ and its complement *the city* agree regarding the ϕ features on both of them. This is a rather odd prediction, since this kind of agreement is not observed in English. Although nominals in the English language do not show overt person-number agreement with its complement, the complement *the city* materializes as *of the city*.

Let us return to the derivation of n*P. Thus far, we have labelled β as $\langle \phi, \phi \rangle$ in accordance with the derivation of v*P. Once labelling of β is finished, the lexical root is raised to n*, which we assume is affixial (see also Chomsky 2015a for the view that a categorizer v* is affixal) and create an amalgam [R-n*], which can label γ . In this fashion, we have derived the structure shown in (38).

- (38) a. $\{\gamma [\text{R-n}^*], \{\beta \text{IA}, \{\alpha \text{R}, \text{IA}\}\}\}$
 b. $\{\gamma [\sqrt{\text{DESTROY-n}^*}], \{\beta \text{the city}, \{\alpha \sqrt{\text{DESTROY}}, \text{the city}\}\}\}$

The important point is that our n*P turned out to be [R-n*] P, as Oishi (2015) also argues. For the sake of simplicity, we occasionally refer to [R-n*n*] P just as n*P.

Another important matter we need to consider is the position the determiner occupies. Although Chomsky (2007) and Chomsky et al. (2019) argues that a determiner originates in a position lower than the nominal categorizer n, we advance a counterargument to this claim.

Merging a definite determiner with the attained [R-n*] P gives rise to the structure in (39).

- (39) a. $\{\delta D, \{\gamma [R-n^*], \{\beta IA, \{\alpha R, IA\}\}\}\}$
 b. $\{\delta \text{the}, \{\gamma [\sqrt{DESTROY}-n^*], \{\beta \text{the city}, \{\alpha \sqrt{DESTROY}, \text{the city}\}\}\}\}$

A problem arises here. If a determiner is a lexical item, hence a head, then the labelling algorithm labels δ as DP in accordance with the head *D the*, contradicting the spirit of our nP hypothesis. Ways to circumvent this unwanted result are provided by Leu (2015) and Chomsky (2019a), though these two measures contradict each other to some degree. Leu (2015) argues that demonstratives and determiners have complex internal structures, meaning that they are constructed by merger of smaller items, whereas Chomsky (2019a) claims that “definite articles are actually features of the nominal phrase, not elements merged into it” (p.51). If we are to adopt Leu’s hypothesis, then it is reasonable to take demonstratives and determiners to be Pair-Merged to the core nominal phrase, since phrasal items are not able to serve as labels. On the other hand, under Chomsky’s analysis, definite articles are taken to be features on a nominal phrase, spelled out separately from the core nominal phrase. In this fashion, Chomsky’s analysis predicts that a definite article like *the* will not serve as a label of δ , thereby the n*P serving as the label of δ . In these respects, their analyses of a definite article are not compatible with each other. Interestingly, Chomsky (2019a:51) continues that a demonstrative like *that* is adjunct, an analysis compatible with Leu’s proposal, since only phrasal items can serve as adjuncts. Therefore, Chomsky’s (2019a) analysis of demonstratives is essentially the same as that of Leu (2015), though their analyses of definite articles remain contradictory. Thus, we need to evaluate their proposals, and as the first step of this attempt, let us first delve into Leu’s claim and then consider Chomsky’s analysis.

Leu (2015), investigating German, Swiss German, and several other languages such as Greek, concludes that determiners and demonstratives are both adjectival phrases, hence phrasal. This argument is based on semantic, morphological and syntactic grounds. Semantically, determiners and demonstratives are similar to adjective phrases, since they modify nominal phrases they Merge with. On the morphological and syntactic grounds, an adjective phrase in German has two inflectional paradigms. i.e., a strong paradigm and a weak paradigm, and Leu (2015) points out that the strong inflections of an adjective and a definite determiner are very similar as shown in (40) below, quoted from Leu (2015:53)

(40)

Nominative			
a.	gut- er good-STR	Wein wine	German
b.	ein a	gut- er good-STR	Wein wine
c.	d- er the-STR	gut- e good-WK	Wein wine

Leu (2015:53)

Simply put, in German, a prenominal adjective shows its strong inflectional form when modifying a bare nominal phrase as shown in (40a) and when following an indefinite article as shown in (40b) (Leu 2015:54). On the other hand, an adjective exhibits its weak inflectional form when it follows a definite determiner, as shown in (40c) (ibid.). Judging by (40), the endings of a definite determiner and an adjective phrase in German are exactly the same, and based on this fact, Leu (2015) suggests that adjective phrases and determiners share a core property. Lue (2015:68) argues that the *-er* endings of both adjectives and determiners are Agree heads (AGR), just like Agree heads (AGR) proposed in Chomsky (1992). However, we do not adopt Leu's AGR analysis, as Chomsky in his later works (e.g., Chomsky 1995, 2007) abandons the Agree Phrases, since it is unreasonable to postulate a head (i.e., a lexical item) with no feature of its own and an Agree head is such a head (Chomsky 2007). Nevertheless, Leu's observation makes it clear that a determiner, though seemingly a simplex lexical item, has in fact a complex internal structure, meaning that it is a phrasal constituent sharing some properties with adjective phrases, and Leu continues that the same holds for demonstratives in German. Furthermore, Leu's observation that a determiner and demonstrative share some properties with adjective phrases in German receives additional support from the distribution of the strong inflections, i.e., the *-er* endings, in the paradigm exhibited in (40). That is, in (40c), where a definite determiner and an adjective phrase cooccur, the definite determiner alone exhibits its strong inflectional form, whereas in other cases where either an adjective phrase or a definite determiner alone is placed in front of a nominal phrase, as in (40a) and (40b), each of these items exhibits a strong inflectional form. Summarizing thus far, Leu (2015), based on semantic, morphological, and syntactic grounds, analyzes determiners and demonstratives as some kinds of adjective phrase, meaning that both of them are phrasal. If so,

at least in German, determiners and demonstratives are not qualified to serve as labels, since phrasal elements are unable to serve as labels in the framework of the labelling algorithm. However, a question arises whether we can apply this analysis to the English language.

Oishi (2015) independently reaches a conclusion similar to that of Leu (2015). Oishi (2015), pointing out that the indefinite article *a* is a weak form of *one* and the definite determiner *the* is “a weak form of the demonstrative “that”” (p. 326), claims that both of them are phrasal constituents, thereby unable to serve as labels. Indeed, the numeral *one* can stand on its own, as in *the number of students who were late was one*, suggesting that the numeral *one* is phrasal. If the indefinite article *a* is really a weak form of the numeral *one*, it is reasonable to assume that the indefinite article *a* is also a phrasal constituent, and the same argument applies to the pair *the* and *that*. Since the demonstrative *that* can also stand on its own, as in *that is mine*, it is reasonable to suppose that the definite article *the*, being the weak form of *that*, is also a phrasal constituent. (A question arises as to whether this weak and strong form analysis is tenable, though. To this issue, we return later.) Supposing that a determiner, demonstrative, and the indefinite article *a* are all phrasal constituents, as just discussed, Oishi (2015) argues that these items, being phrasal, are Pair-Merged to the nominal phrases as adjuncts. (Notice that this point is essentially the same as Chomsky’s analysis of demonstratives, though their analyses of definite articles differ from each other.) Since a Pair-Merged item is invisible to the labelling algorithm, as it is placed on a separate plane from the one to which the labelling algorithm applies (Chomsky 2019a), Oishi supposes that it is the nominal phrase to which a determiner, demonstrative, or an indefinite article is Pair-Merged as an adjunct that serves as the label of the entire structures. In other words, Oishi (2015) claims that in the configuration shown in (39), repeated here as (41), the n*P always wins the labelling competition, since what we call a determiner is actually an adjunct, which is invisible to the labelling algorithm. Therefore, the structure below is labelled nominal in accordance with n*P, which is the sole constituent visible to the labelling algorithm searching δ .

- (41) a. $\{\delta D, \{\gamma [R-n^*], \{\beta IA, \{\alpha R, IA\}\}\}$
 b. $\{\delta \text{the}, \{\gamma [\sqrt{DESTROY}-n^*], \{\beta \text{the city}, \{\alpha \sqrt{DESTROY}, \text{the city}\}\}\}\}$

Overall, Oishi’s claim just outlined seems to be tenable both on semantic and theoretical grounds. The theoretical plausibility of Oishi’s analysis is as just outlined. Additional

theoretical plausibility of the analysis developed in Oishi (2015) is as follows. Within the POP (+) framework, phrasal constituents are unable to serve as labels. If a determiner, demonstrative, and an indefinite article all belong to phrasal constituents, as Oishi (2015) supposes, then the {the, n*P} configuration shown in (41) is actually of the form {XP, YP}, rather than {X, YP}, with both XP and YP being phrasal, and X being a head, i.e., a lexical item. Recall that a {XP, YP} configuration is labelled either by (i) raising XP or YP to some higher position or by (ii) features on XP and YP agreeing. The first option, i.e., raising, is untenable here, since there are no empirical data showing that either the definite article *the* or the n*P in (41) is raised to any higher position. The second option, i.e., agreement, is not considered here, though Agree receive certain amount of plausibility. Recall that Leu (2015) provides evidence that a definite determiner in German shows an agreement morpheme, suggesting that Agree is not unavailable in labelling δ in (41). However, recall that n* has already assigned its φ features to R, thereby n* lacking any features at the current stage of the derivation. If we are to resort to Agree between *the* and n*P in labelling δ , i.e., the {the, n*P} configuration in (41), both *the* and n*P must be equipped with features that agree, though we have just noted that n* lacks its φ features at this stage of the derivation, meaning that n*P has no features that agree with the features on *the*. Indeed, one could introduce some new features to n* just for making possible Agree between *the* and n*P, though this kind of move is simply ad hoc and thereby must be avoided. Therefore, Agree is an unavailable option in labelling δ . One could argue that the unvalued φ features dispatched to R might serve as the features that agree with the features on *the*. However, this supposition is untenable, since the unvalued features in question has already been valued via agreement with IA in β , and thereby deleted (see Chomsky 2004). On the semantic side, Oishi's analysis is plausible in that it is compatible with my intuition that a demonstrative is an adjunct, modifying a nominal phrase to which the demonstrative in question adjoins. We are not satisfied with Oishi's analysis, though, as my intuition states that a definite determiner *the* and the indefinite article *a* are not adjuncts, having equal statuses with other adjunct phrases, the most typical of them are adjective phrases. To this point, we return later.

Summarizing, Oishi's analysis is plausible in that this analysis successfully labels the {the, n*P} configuration in (41) without recourse to raising operations, which receive no empirical support. Furthermore, Oishi's analysis correctly captures the semantic similarity between an adjunct phrase and demonstrative, both of which modifies the meanings of the nominal phrase to which they are Peir-Merged. However, Oishi's supposition left some unsatisfactory points regarding the analysis of definite and indefinite articles, to which we will

return later. Furthermore, the validity of Oishi’s analysis based on weak and strong form relations is of a questionable status. Let us consider the validity of this weak/strong form relation first.

Indeed, the indefinite article *a* is semantically rather similar to the numeral *one*, though they have subtle meaning differences, and Rissanen (1999) states that indefinite articles *a/an* and the numeral *one* derive from the same origin, i.e., the numeral *an* in Old English. Therefore, the indefinite article and the numeral *one* not only share the same origin but also share a very similar meaning. In this regard, Oishi’s claim that an indefinite article *a/an* is a weak form of the numeral *one* seems to be justifiable. The same seems to hold of the case of *the* and *that*. According to Lass (1992) the definite article *the* in the Present-Day English stems from a deictic adjective/pronoun in Old English, which had a fully inflected paradigm as shown in (42) below, quoted from Lass (1992:112)

(42)

	Singular			Plural
	Masculine	Neuter	Feminine	(all genders)
Nominative	sĕ	þæt	sĕo	þā
Genitive	þæ-s	þæ-s	þæ-re	þā-ra
Dative	þæ-m	þæ-m	þæ-re	þæ-m
Accusative	þo-ne	þæt	þā	þā

(Lass 1992:112)

Lass (1992) argues that the initial *s-* in the Masculine and Feminine Nominative changed into *þ-* by what he calls “analogical levelling” (Lass 1992:112), and from the resulting paradigm, he argues, the invariant *the* arose. According to Mustanoja (1985 [1960]: 233), the demonstrative *that* also stems from the same deictic adjective/pronoun, and Fischer (1992:217) even specifies the Neuter Nominative/Accusative *þæt* as the origin of *that*. (Interestingly, *this* and *these* come from a different paradigm, meaning that *this* and *these* are etymologically not directly related to *the* or *that* (see Lass 1992).) If so, *the* and *that* are cognate and also share a rather similar meaning, thereby providing theoretical support to Oishi’s claim that the definite determiner *the* is the weak form of the demonstrative *that*.

However, a question remains whether or not these arguments just advanced are convincing enough to justify Oishi’s analysis based on the weak and strong form relations. If semantically similar cognate items are considered to be in a weak and strong form relation,

more items can also be in the same kind of relation. For instance, it is a common wisdom that *to* in the *to* + infinitive construction, as in *to work hard*, stems from the preposition *to*, meaning that these two items are cognates. Although these two items have rather different meanings, *to* in the *to* + infinitive construction retains its original flavor, since *to* + infinitive construction is future oriented, meaning that the *to* + infinitive construction tends to be employed to express a future event, rather than the past. In this respect, *to* in the *to* + infinitive construction can be argued to retain its original directional meaning. If so, it follows that *to* as a preposition and *to* in the *to* + infinitive constructions are in a weak and strong form relation. Therefore, Oishi's analysis is fraught with dangers of inflations; the number of strong/weak form pairs might arbitrarily increase. Therefore, cautions are necessary if we are to adopt Oishi's analysis, which is based on the weak/strong form relations.

Furthermore, it turns out that the validity of Oishi's claim that the definite determiner *the* is a weak form of a demonstrative *that* is in a dubious status. To verify his claim, Oishi (2015) points out that a demonstrative like *that* occupies the same structural position as the definite determiner *the*, a widely accepted idea in the generative field. Since the definite determiner *the* and a demonstrative like *that* do not cooccur, they are believed to occupy the same structural position, i.e. the D position. However, one occasionally comes across counterexamples to this claim. For instance, Leu (2015) cites the below example from Greek, where a demonstrative cooccurs with a morpheme which serves as a definiteness marker.

(43)

afto	to	vivlio	Greek
this	the	book	
			Leu (2015:29)

It is unclear whether the definite morpheme *to* in Greek corresponds to the definite determiner *the* in the English language, though Leu (2015:49) cites the example below, where *to* alone serves as a definite marker.

(44)

to
the

vivlio
book

Greek

Leu (2015:49)

Judging from the example in (44), the definite morpheme *to* in Greek seems to roughly correspond to English *the*, and (43) shows that *to* can cooccur with a demonstrative *afto*. If this situation is applicable to the English language, one of the grounds Oishi's analysis rests on collapses. In Greek, a determiner and demonstrative do not compete with each other for the same structural position. This fact weakens Oishi's claim that *the* is a weak form of *that*, thereby occupying the same structural position. Leu and Oishi's analyses have brought us thus far, though it turns out their analysis is flawed.

Let us consider Chomsky's analysis. Recall that Chomsky (2019a:51) argues that definite articles are in fact features originating on nominal phrases, spelled out separately from the nominal phrases. Chomsky (2019a:51) further supposes that demonstratives like *this* and *that* are adjuncts, Pair-Merged to the nominal phrases. Chomsky's supposition solves every problem that has thus far arisen. Since a definite determiner is actually a feature originating on the nominal phrase, the definite determiner can cooccur with a demonstrative like *that*. In this regard, the case of polydefinite, where a demonstrative cooccurs with yet another definite marker, as shown in (43), turns out to be not problematic at all. Furthermore, if a definite determiner like *the* is really a feature of a nominal phrase, it is reasonable to assume that it does not serve as a label for the entire nominal phrase. Therefore, the labelling issue that confronted us in (39), repeated here as (45), is resolved.

- (45) a. $\{\delta D, \{\gamma [R-n^*], \{\beta IA, \{\alpha R, IA\}\}\}\}$
b. $\{\delta \text{the}, \{\gamma [\sqrt{DESTROY}\text{-}n^*], \{\beta \text{the city}, \{\alpha \sqrt{DESTROY}, \text{the city}\}\}\}\}$

Since the definite determiner *the* is not a head, i.e., a lexical item, but rather a feature originating on the nominal phrase itself, it is not qualified to serve as a label of δ . Since labelling algorithm looks for features on heads, rather than a head itself, one can point out that the definite determiner, being actually a feature, is able to serve as a label, though we do not consider this possibility here. The crucial reason for this judgement is that the definite article is not a feature introduced when constructing δ in (45). Under Chomsky's (2019a) supposition,

the definite article is taken to be a feature of a nominal phrase. If so, the feature in question is already present in γ , i.e., an n*P. Therefore, the δ layer itself does not exist, since D in (45) is just an element separately spelled out from the core nominal phrase. In this respect, the presence of the D layer in (45) does not have any impact on the label of δ , i.e., {D, n*P}. Thus, δ in (45) is labelled nominal phrase.

Thus far, Chomsky’s analysis of a definite article has made correct predictions. Therefore, we adopt his analysis of definite articles, rather than Leu (2015) and Oishi’s (2015) analyses, where a definite determiner is taken to be a phrasal item, thus Pari-Merged to a nominal phrase, as argued in Oishi (2015).

Chomsky (2019a:51) takes demonstratives like *that* and *this* to be adjuncts, Pair-Merged to nominal phrases. This analysis of demonstratives is essentially the same as the one developed in Oishi (2015). Since phrasal items alone serve as adjuncts, Chomsky and Oishi’s analyses of demonstratives are compatible with that in Leu (2015), where demonstratives are argued to have complex internal structures, thereby being phrasal items.

Let us here consider the internal structure of demonstratives. Chomsky (2013a) suggests that demonstratives *that*, *this*, *these* etc. are “morphologically complex” items (p. 46), with the initial *th-* standing for definiteness and latter parts are adjectival in nature (Chomsky 1995). If so, the initial part of a demonstrative seems to share some properties with a definite article, which turns out to be just a definite feature of a nominal phrase, though we do not delve into this issue here, since our immediate concern is not on the internal architecture of a demonstrative, but rather on how to label a nominal phrase itself. Thus, let us return to the derivation of n*P.

Thus far, we have constructed δ in (45), repeated here as (46), and labelled it as a nominal phrase.

- (46) a. $\{\delta D, \{\gamma [R-n^*], \{\beta IA, \{\alpha R, IA\}\}\}\}$
 b. $\{\delta \text{the}, \{\gamma [\sqrt{DESTROY}-n^*], \{\beta \text{the city}, \{\alpha \sqrt{DESTROY}, \text{the city}\}\}\}\}$

Since the definite article in (46) is a feature of the nominal phrase, spelled out separately from the nominal phrase (Chomsky 2019a:51), the δ layer itself does not exist in narrow syntax or the CI interface. This means that the δ layer is a mere phonological effect, only arising in the SM interface. Thus, (46) should be modified to (47).

- (47) a. $\{\gamma [R-n^*], \{\beta IA, \{\alpha R, IA\}\}\}$

- b. $\{\gamma[\sqrt{DESTROY}\text{-n}^*], \{\beta \text{ the city}, \{\alpha \sqrt{DESTROY}, \text{ the city}\}\}\}$

What is shown in (47) is a possible CI representation of the nominal phrase we are constructing, i.e., *the destruction of the city*. When a demonstrative like *that* is Pair-Merged to this structure, the label of the entire structure is unchanged, since a demonstrative, being Pair-Merged to the current structure shown in (47), is always invisible to the labelling algorithm. Thus, the categorical status of the entire structure remains unchanged.

Since we adopt Chomsky’s analyses of both definite articles and demonstratives, an interesting question arises as to why the English language does not allow a definite article to cooccur with a demonstrative, as shown in the Greek example (43) cited from Leu (2015:29). Even when the structure in (47) has a definite feature, we must be able to add a demonstrative to the current structure by Pair-Merging the demonstrative to (47). The resulting structure will be (48), with a Demonstrative being Pair-Merged to γ , thus invisible to the labelling algorithm.

- (48) a. $\{\delta \text{ Demonstrative}, \{\gamma[\text{R-n}^*], \{\beta \text{ IA}, \{\alpha \text{ R}, \text{ IA}\}\}\}\}$
 b. $\{\delta \text{ this}, \{\gamma[\sqrt{DESTROY}\text{-n}^*], \{\beta \text{ the city}, \{\alpha \sqrt{DESTROY}, \text{ the city}\}\}\}\}$

We predict that the structure in (48) is spelled out as *this the destruction of the city*, an unwanted result. When the Pair-Merged demonstrative is *that*, instead of *this*, the output will be *that the destruction of the city*, an unwanted outcome as well. One way to prevent this kind of unwanted outcome is to introduce a stipulative condition, which states that in the English language, a demonstrative must not be Pair-Merged to a nominal phrase when the nominal phrase in question has a definite feature, a totally ad hoc move. A better solution to this problem is provided by Chomsky’s analysis on the internal structure of demonstratives. Recall that Chomsky (2013a) suggests that demonstratives *that*, *this*, *these* etc. are “morphologically complex” items (p. 46), with the initial parts *th-* standing for the definiteness and latter parts are adjectival in nature (Chomsky 1995). If Chomsky’s analysis is on the right track, a demonstrative like *this* has already has a definiteness marker, spelled out as *th-*. We suppose that this initial part of a demonstrative corresponds to the definite article *the*. If so, it follows that a definite marker is incorporated in what we call a demonstrative and for this reason, an output like *this the book* is unavailable. Simply put the definite feature *the* is already present in the demonstrative *this* in this case. We are not able to spell out the same definite feature twice.

Note that Chomsky’s (2019) analysis left unexplained the indefinite article *a*. There are two ways to analyze the indefinite article *a/an*. One is to follow Oishi (2015) in assuming that

an indefinite article *a/an* is a weak form of the numeral *one*, Pair-Merged to a nominal phrase. The other way is to assume, somewhat extending Chomsky's (2019a) proposal, that the indefinite article *a/an* is a phonological realization of an indefinite feature on a nominal phrase. Either way, the entire structure is labelled nominal. Although there is no compelling evidence to support either of these two measures, we are inclined to adopt the second approach, where the indefinite article *a/an* is taken to be a feature originating in nP/n*P. The first reason for this is that as we have already noted, the strong/weak form analysis developed in Oishi (2015) is not so cogent. Furthermore, since the indefinite article *a/an* seems to serve as the indefinite counterpart of the definite determiner *the*, it is reasonable to suppose that the indefinite article *a/an* is also a feature originating in nP/nP. For these two reasons, we assume that *a/an* is just an indefinite feature, spelled out separately from the core nominal phrase.

Chomsky's analyses have thus far provided satisfactory explanations to nominal constructions. However, there are some drawbacks to Chomsky's analyses. His analyses cannot explain how an agentive theta-role is assigned to the External Argument of the nominalized expression. For illustration, consider (49).

(49) The enemy's destruction of the city

In (49), *the enemy* is obviously the performer of the action. Thus, the nominalized form in (49) has its verbal counterparts, as shown in (50).

- (50) a. The enemy destroyed the city
 b. The enemy has destroyed the city.
 c. The enemy will destroy the city.

Since *the enemy* in all the examples in (49-50) are interpreted as the performers of the actions, they must bear the agentive theta-roles (i.e., AGENT). As we have already seen, the theta-role assignment is associated with External Merge (Chomsky 2021, forthcoming), meaning that a syntactic object Externally Merged to a theta-position can alone receive a theta-role from an appropriate theta-assigner (ibid.). If so, we are faced with difficulties in explaining how the agentive theta-role is assigned to *the enemy* in the nominalized form in (49), since *the enemy* in (49) is Pair-Merged to the n*P. Since Pair-Merge is different from External Merge (i.e., a binary set formation operation), Pair-Merged items are not able to receive a theta-role within Chomsky's (2021, forthcoming) framework. Thus, we need to

provide a principled answer to how *the enemy* in the nominalized form in (49) has received its agentive semantic role.

As a first step to resolving this issue, let us carefully reconsider the nominalized form in question (i.e., the example in (49)), repeated here as (51) for convenience.

(51) The enemy's destruction of the city

Although we have just remarked that *the enemy*, which arguably serves as the subject of this nominalized phrase, is Pair-Merged to the n*P *destruction of the city*, this statement is incorrect in a strict sense. A careful scrutiny reveals that *the enemy* is first Externally Merged with a possessive morpheme *-s*, and then the resulting structure {the enemy, *-s*} is Pair-Merged to the n*P in question, i.e., *destruction of the city*. This observation seems to be a valid one, and if so, the sole way to get around the issue of theta-role assignment is to assume that the possessive clitic *-s* is a theta-assigner and assigns a theta-role of AGENT to the constituent Externally Merged with this morpheme. This seemingly ad hoc analysis is not so far-fetched in light of Chomsky's remark on which constituents serve as theta-role assigners. Chomsky (forthcoming:7) states that at least a lexical root R, an adposition, and a verbal phrase itself count as theta-role assigners (see Chomsky and Lasnik 1993 for an idea where a preposition can also serve as a theta-role assigner). Although these items do not seem to exhaust the possible theta-assigners, at least we can count adpositions as theta-role assigners. If so, our seemingly ad hoc statement that the possessive clitic *-s* can serve a theta-role assigner turns out to be valid in that the constructions of the form *-'s* such as *his*, *Tom's*, and *the enemy's* semantically correspond to prepositional constructions such as *of him*, *of Tom*, and *of the enemy*. Thus, it seems that we can safely claim that in the case of (51) *the enemy's destruction of the city*, the possessive clitic *-s* assigns the agentive semantic role to *the enemy*, which is Externally Merged with the morpheme in question.

Another problem arises here as to the relation between *the enemy's* and the n*P in question. Although we have seen that *the enemy* in (51) has received its agentive theta-role from the possessive morpheme *-s*, we have not explained how this constituent with the agentive theta-role (i.e., *the enemy's*) is related to the n*P in question, i.e., *destruction of the city*. In other words, we have just stated that *the enemy* in (51) has an agentive theta-role, thereby interpreted as a performer of some action, though the task remains to determine what activity *the enemy* is the agent of.

To address this issue, we first consider the case of a passive construction as shown

below.

(52) He was killed by Mary.

In (52), *Mary* is obviously the performer of the action of killing and seems to have the agentive theta-role. Following the above discussion, we take the preposition *by* to be a theta-role assigner and have assigned the theta-role of AGENT to *Mary*. An unanswered question is why this agentive role on *Mary* is interpreted as the agent of killing described by the vP, since *by Mary* as a whole is a vP/VP adjunct and thereby must have been Pair-Merged to the relevant vP/VP. Since passivization is a valency reduction operation (Brinton and Arnovick 2017), passivization reduces the number of arguments a predicate has. If so, since the valency of the verb *kill* is two, i.e., AGENT and THEME, the valency of the passivised form *killed* must be one. In this regard, the sole legitimate argument of the passivized form of the verb *kill* (i.e., *killed*) is *he*, which bears the theta-role of THEME, since this person is the patient of the action of killing. Here, we advance a bold conjecture that after a valency reduction operation has applied such as passivization, a lexical item which has the inherent valency of two (e.g., a transitive verb) can take as a pseudo-argument an adjunct phrase (i.e., a Pair-Merged item). More precisely, this conjecture is an interpretation rule, rather than an actual syntactic one, since the Pair-Merged item is placed on a separate plane from other constituents and thereby not in any direct theta-role assigner/assignee relation with the relevant constituent (i.e., the vP *killed HE* in this case). Thus, although the adjunct *by Mary* has no direct theta-role relation with the vP *killed*, the CI interface, following this interpretation rule, interprets the agentive theta-role on *Mary* as the agent of the action described by the vP *killed HE*.

This interpretation rule, however plausible it might be, seems to be ad hoc. Indeed, this rule relies on the context in which the verbal constituent and the adjunct are placed. However, consider (53).

(53) By Tom.

Even in an out of the blue context, *Tom* in (53) may be interpreted as a performer of some action, though what activity he performed is unknown. This means that Chomsky and Lasnik's (1993) claim that a preposition can serve as a theta-role assigner is a sound one, since *Tom* in (53) has the agentive theta-role even in an out of the blue context. If this

structure is adjoined to a passivized form of a transitive verbal phrase, which has lost its agentive argument due to the passivization, it is reasonable to assume that the constituent with the theta-role of AGENT is interpreted as the agent of the action described by the verbal phrase. Therefore, the interpretation rule presented above, though seems rather ad hoc, is an inevitable semantic outcome.

We stretch this argument to the explanation of the case of nominalization in (51), repeated here as (54) for convenience.

(54) The enemy's destruction of the city

We have already hypothesized that *the enemy* has received an agentive semantic role from the possessive clitic *-s*, though why *the enemy* is interpreted as the agent of the activity described by the n*P *destruction of the city* is left unexplained. As Chomsky (forthcoming:7) states that a lexical root R can serve as a theta-role assigner, we take the lexical root $\sqrt{DESTROY}$ serves as a theta-role assigner. Since the verb *destroy* is a transitive verb and has two arguments, i.e., AGENT and THEME, we suppose the lexical root $\sqrt{DESTROY}$ has the valency of two, i.e., the lexical root $\sqrt{DESTROY}$ has the inherent ability to assign these two theta-roles to arguments. More precisely, the lexical root R in question assigns the theta-role of THEME to its complement, and the whole structure $\{v^*, \{R, IA\}\}$ assigns the agentive theta-role to its sister (i.e., an item Externally Merged to it) (Chomsky forthcoming). Here, an important problem arises as to whether or not a nominalization is a kind of valency reduction operation as in the case of passivization. To address this issue, let us consider (55).

(55) The destruction of the city was terrible.

As (55) shows, a nominalized form can appear without an explicit agent; it is unclear from (55) who or what destroyed the city. This property of nominalization is similar to that of passivization, since passives without any explicit agentive constituent are acceptable, or in most cases, passives have their agents hidden. Thus, we can safely state that nominalization is also a case of valency reduction operations. If so, the n*P in (54) *destruction of the city* is unable to assign any agentive role, though the lexical root $\sqrt{DESTROY}$ has the inherent property to do so. In this case, the interpretation rule outlined above comes in, and the agentive role on *the enemy* is interpreted as the agent of the action

described by the n*P (i.e., *to destroy the city*). In this fashion, the adjoined phrase is appropriately interpreted as the agent of the activity described in the nominalized form.

Thus far, we have successfully derived and labelled a nominal construction with a complement. We have seen that the derivation of a nominal phrase by and large mirrors that of a verbal phrase with some exceptions, the most notable one of which is its theta-role assignments. Although the theta-role of THETA is assigned to the complement of the lexical root, as in the case of its transitive verbal counterpart, the theta-role of AGENT is assigned in a different manner from that of a v*P. In the case of v*P, the agentive theta-role is assigned to the External Argument EA by Externally Merging EA and {v*, {R, IA}} (Chomsky forthcoming), whereas in the case of n*P, an agentive theta-role is not directly assigned by the n*P in question, since a constituent seemingly bearing an agentive theta-role is Pair-Merged to the n*P. It turns out that we need to introduce an interpretation rule allowing such a reading. Although this interpretation rule seems totally ad hoc, it is justifiable since the same interpretation rule is necessary in a case of passivization. In this way, we have overcome the shortcomings with Chomsky's (2019a) analysis, in which *the enemy's* in *the enemy's destruction of the city* must be pair-Merged to the n*P.

2.6.2 The derivation of nP

This section considers the derivation of an nP, the internal structure of which in our theory corresponds to that of vP. Recall that vP is associated with intransitive structures such as unaccusative and passive constructions (Chomsky 2001, 2005, 2007). Let us first consider the case (56a) below, which apparently mirrors its unaccusative verbal counterpart shown in (56b).

- (56) a. His late arrival
b. He arrived late.

Since we predict that the derivation of nP mirrors that of vP, this section considers the internal structure of nP shown in (56a) in comparison with its verbal counterpart shown in (56b). Recall that the first step of the derivation of an unaccusative verbal construction such as *he arrived* is merger of the lexical root R and the Internal Argument IA, yielding a syntactic structure {R, IA}. Therefore, it seems to be reasonable to assume that its nominal counterpart has the same derivational first step, i.e., merger of the lexical root R and the Internal Argument IA, giving rise to the syntactic structure {R, IA}. The resulting structure {R, IA}, Chomsky

(forthcoming:7) states, is a configuration in which the Internal Argument IA receives its theta-role from the lexical root R, since the IA is Externally Merged with the theta-role assigner R (Chomsky forthcoming: 7). The resulting structure $\{R, IA\}$, we assume, is then Merged with a nominalizer n , yielding a syntactic structure shown in (57a), with (57b) exhibiting the form with actual lexical items.

- (57) a. $\{n, \{R, IA\}\}$
 b. $\{n, \{\sqrt{ARRIVE}, HE\}\}$

Note that the structure in (57a) corresponds to its verbal counterpart, the relevant derivational step of which is shown in (58).

- (58) $\{v, \{R, IA\}\}$

Recall that we have assumed that in the case of vP , v is not a phase head, thus unable to assign unvalued ϕ features to the head immediately below it, i.e., the lexical root R. This is because we have assumed that v , which is not a phase head, lacks its inherent ϕ features to assign to R. Given this assumption, we have supposed that the Internal Argument IA does not raise to the “specifier” of R, since ϕ feature agreement does not apply there. (We have also assumed that after T is introduced into the derivation, the IA is directly raised by Internal Merge to the “specifier” of T position, and after C enters the derivation, assigning its ϕ features to the T, the IA and T agrees, with the IA receiving its nominative case.) Furthermore, in the case of the verbal configuration in (58), the lexical root R is then raised to v and amalgamated with v there, forming an amalgam $[R-v]$, which labels the entire structure. Given these assumptions, it is reasonable to assume that in the case of nP in (57), the Internal Argument IA does not raise to the “specifier” of R, as in the case of its vP counterpart, and the lexical root R raises to n , forming an amalgam $[R-n]$, also as in the case of its vP counterpart just discussed. The resulting syntactic object is shown in (59) below, with (59b) showing the form with actual lexical items.

- (59) a. $\{[R-n], \{R, IA\}\}$
 b. $\{[\sqrt{ARRIVE}-n], \{\sqrt{ARRIVE}, HE\}\}$

We suppose that this amalgam [R-n] is spelled out as *arrival* and as in the case of its verbal counterpart, the resulting amalgam [R-n] is able to label the entire structure. Since a nominalizer n in the English language is unable to assign a case to the Internal Argument IA, the Internal Argument IA realizes as *of him* or *his* in line with Chomsky (2004). Although Chomsky (2004) only states that the IA in the {n, {R, IA}} configuration realizes as *of NP* since the IA in question cannot receive a case from n, we take the genitive case (*his*) to be employed in appropriate syntactic environments since *his*, being in a genitive case, is semantically similar to *of him*. The question is what is such an appropriate syntactic environment. A possible idea is that we take a genitive case to be assigned to the first NP in the {NP, NP} configuration, in line with Radford (2009, 2016). Given this analysis, the IA *HE* in the nominal construction (59) is to realize as *his* or *of him* depending on where the IA in question is spelled out; when the IA in question remains *in-situ*, it is spelled out as *of him*, whereas when the IA in question is placed for some reason at the initial position of the relevant nominal construction, the IA realizes in its genitive case, i.e., *his*. Therefore, the nominal structure in (59) is spelled out either as *arrival of him* or *his arrival*. We take the adjective *late* to be an nP adjunct.

However, this seemingly plausible analysis is put into question, given the analysis outlined earlier with regard to nominalization. We have already assumed in section 2.6.1 that nominalization is a valency reduction operation, by which the number of arguments a predicate takes reduces by one (see Brinton and Arnovick 2017). If so, since the lexical root \sqrt{ARRIVE} inherently takes one argument THEME, it is reasonable to assume that its nominalized form *arrival* is unable to take any genuine argument. If so, the analysis just outlined should be reconsidered in light of this assumption. We have already assumed that the derivational first step of a nP we are considering here is merger of the lexical root R and the Internal Argument IA, forming a syntactic object {R, IA}, and in this resulting configuration {R, IA}, the Internal Argument IA *HE* receives the theta-role of THEME from the lexical root \sqrt{ARRIVE} . This analysis turns out to be problematic given the valency reductional nature of nominalization.

Let us consider how to get around the present issue. Since our earlier assumption took the Internal Argument IA to be Externally Merged with the lexical root R, the resulting structure is inevitably of the form {R, IA}, where the IA, Chomsky (forthcoming:7) states, receives its theta-role from R. We need to avoid this result, since we have supposed that the nominalized form *arrival* does not take any argument. A likely way to resolve this issue is to suppose that *HE* is Pair-Merged with the lexical root R, whereby *HE* serves as an adjunct

phrase. (Henceforth, we use *HE* instead of the Internal Argument IA, since the constituent in question does not serve as an argument in the present analysis.) Since *HE* is Pair-Merged, it does not receive any theta-role from R, thereby satisfying the condition on the number of arguments the relevant lexical root R takes. The apparent semantic role on *HE* in *his arrival* or *arrival of him* is explained in the same way as that proposed in the previous section. That is, in the present case, we assume that the clitic *-s* and the preposition *of* are both theta-role assigners, meaning that an element Externally Merged with either of these items is assigned the theta-role of THEME. (The theta-role of THEME describes an entity which undergoes some change through the activity described in the predicate (Radford 2009).) Since at this point, it is unclear of which activity *HE* is interpreted as the THEME, an interpretational rule similar to the one advanced in the previous section is necessary, by which *HE* is interpreted at the CI interface as the THEME of the activity described in the nominalized form *arrival*. Although this interpretation rule is tinged with an ad hoc flavor, this kind of rule is necessary if we are to stick to the traditional argument-adjunct distinctions and adopt the framework on theta-role assignments outlined in Chomsky (2021, forthcoming)¹⁵.

However, this seemingly legitimate analysis just presented is faced with a look-ahead problem, where a derivation must be aware of its future step in order for it to be successfully derived. In the present case, although we have supposed that *HE* is Pair-Merged to the lexical root \sqrt{ARRIVE} , this analysis presupposes that the current derivation somehow knows that a nominalizer *n* will be introduced into the resulting structure. In other words, in order for *HE* to be Pair-Merged to the lexical root \sqrt{ARRIVE} , the initial stage of the derivation must be aware that *n* will be introduced into the derivation despite the fact that \sqrt{ARRIVE} and *HE* have not yet Pair-Merged. Chomsky (2021) and Chomsky et al. (2013) stress that a derivation is Markovian, meaning that a given derivation is unaware of its derivational history or its future state. In light of this property of the derivation, the analysis just advanced is obviously flawed.

A likely way to resolve this problem is to just go back to the original analysis, where *HE* and \sqrt{ARRIVE} are Externally Merged, and suppose in a rather ad hoc manner that nominalization of a one-place predicate is not a valency-reducing operation. This rather ad hoc analysis receives its support from empirical data shown below.

(60) a. The enemy's destruction of the city was terrible,

¹⁵ However, see McInnerney 2022 for the view that traditional argument-adjunct distinctions should be dispensed with and constituents which have long been considered to be adjuncts should be reanalyzed as arguments.

- b. The destruction of the city was terrible.
- c. ?The destruction was terrible.

- (61) a. His late arrival upset the boss.
- b. The late arrival of him upset the boss.
 - c. ?The late arrival upset the boss¹⁶.

In the case of a two-place predicate like $\sqrt{DESTROY}$, the omission of the “External Argument” EA in the nominalized form result in a grammatical form, as shown in (60a), meaning that the “External Argument” is not in fact a genuine argument in the nominalized form, as we have discussed in the previous section. Interestingly, when the Internal Argument *the city* is omitted, as in (60c), the grammaticality of the attained phrase is slightly degraded. This suggests that the Internal Argument of the nominalized two-placed predicate is still a genuine argument, suggesting that it must receive its theta-role from an appropriate theta-role assigner. However, as the examples in (61a-c) reveal, in the case of a one-place predicate like \sqrt{ARRIVE} , its argument (i.e., *his/of him* in the present case) must be overtly realized, with the ill-formedness of (61c) being attributed to the omission of the argument *his/of him*. In this regard, we can state that in the case of nominalization of a one-place predicate, its sole argument must be overtly realized, and this empirical fact supports our seemingly ad hoc analysis with regard to nominalization; nominalization is a kind of valency-reducing operation iff the predicate nominalized is a n-place predicate, with n being 2 or larger than 2. A question arises as to why nominalization has this kind of asymmetric property. A likely answer to this question is that a nominalizer enters the derivation only after the {R, IA} configuration has been constructed, meaning that even though nominalization is a valency-reducing operation, since by the time n enters the derivation the {R, IA} configuration has been completed, the nominalizer n is neither able to change the already constructed syntactic object {R, IA} nor able to erase the theta-role already assigned to the IA, in accordance with the No-Tampering Condition proposed in Chomsky (2019a, 2021, among others). The No-Tampering condition states that a syntactic object, once constructed, is immune to further modification (Chomsky 2019a). In this regard, in the case of a one-place predicate like \sqrt{ARRIVE} , nominalization cannot reduce the number of argument(s) the root inherently takes, since by the time n is introduced into the derivation, the {R, IA} configuration has already been constructed. If the nominalizer n

¹⁶ An informant comments that (61b) is odd, whereas (61c) is acceptable, contrary to our prediction. This judgement undermines our theory, though we put aside this issue here.

modified the {R, IA} configuration, this move would violate the No-Tampering Condition.

In light of this observation, we advance the final version of the derivation of *his arrival/the arrival of him*. Since the derivation is Markovian, it only considers its present state, unaware of its derivational history or its future state (see Chomsky 2021). Therefore, the initial step of the derivation must be External Merge of the lexical root R and the Internal Argument IA, as shown below.

$$(62) \text{ Merge (R, IA) = \{R, IA\}}$$

The current stage of the derivation does not know whether the resulting structure {R, IA} will be Merged with a verbalizer *v* or a nominalizer *n*. Therefore, even though we have supposed that nominalization is a kind of valency-reducing operation, its effect must not be present at this stage, since *n* has not yet entered the derivation or the current derivation is unaware that *n* will be introduced into the derivation. Thus, the IA in the {R, IA} configuration receives its theta-role from R, in accordance with framework on theta-role assignment proposed in Chomsky (forthcoming:7).

A nominalizer *n* then enters the derivation, resulting is the structure shown below.

$$(63) \text{ Merge (n, \{R, IA\}) = \{n, \{R, IA\}\}}$$

At this stage, the derivation realizes that it is deriving a nominalized form, though it is too late to tamper with the already constructed syntactic object {R, IA} in accordance with the No-Tampering Condition (Chomsky 2021, among others). Thus, *n*, introduced at this stage of the derivation, is unable to reconstruct {R, IA} to form a Pair-Merged structure or erase the theta-role of THEME already assigned to the IA. The *n* and R in the structure {n, {R, IA}} shown in (63) then undergoes an amalgamation operation, forming [R-*n*], as shown in (64).

$$(64) \text{ \{[R-n], \{R, IA\}\}}$$

We assume in line with Chomsky (2015a) that a nominal categorizer *n* is affixal in nature (see Chomsky 2015a for the view that the categorizer *v** is affixal in nature), thus *n* being affixed (Pair-Merged) to R (see Chomsky 2015a for an amalgamation of *v** and R). The resulting amalgam [R-*n**] is able to label the entire structure shown in (64) and the structure in question is labelled [R-*n*]. The realization of the Internal Argument IA is as outlined above.

Thus far, we have considered the derivation of an nP. We have seen that although nominalization is a valency-reducing operation, due to the No-Tampering Condition, nominalization of a one-place predicate is unable to reduce the valency of the predicate. Therefore, the derivation of nP and vP proceed in exactly the same way. In the next section, we delve into the issue of referential properties on nominals, which the literature argues reside in the D layers in nominal phrases.

2.7 Referential properties revisited

In this section, we are going to argue that a referential property is not restricted to D layer of a nominal phrase, but rather depends on the lexical items employed in the nominal construction. By advancing this claim, we challenge one of the grounds the DP hypothesis rests on. That is, the DP hypothesis associates the determiner layers with the referential properties of nominal expressions. A nominal equipped with a determiner layer has its referential property, and vice versa. However, we argue against this claim by showing that there is no such functional layer dedicated to a referential property. We further advance the claim that a referential property of a nominal phrase comes from a Pair-Merged item.

Before going into intricacies of referential properties, we define a referential property as the ability to refer to an entity in the real world. If so, a nominal phrase lacking a referential property is unable to refer to an actual entity in the real world, whereas a nominal phrase with a referential property is able to do so. For illustration, consider the paradigm below.

- (65) a. the dog
b. a dog
c. this dog, that dog
d. dog

Within the paradigm exhibited in (65), (65d) alone is unable to refer to an actual dog in the real world. Therefore, the bare nominal *dog* in (65d) lacks a referential property. In the DP hypothesis, a referential property of a nominal phrase is associated with the D layer of the nominal phrase. In this respect, one can argue that the bare nominal in (65d) lacks a referential property because it lacks a determiner layer. The opposite arguments apply to other nominal phrases in (65); they have referential properties since they are equipped with determiners.

However, closer scrutiny reveals that referential properties are not restricted to determiner positions. For instance, consider the cases below.

- (66) a. You should not pull this hard.
b. You should not pull so hard.

If (66a) is uttered to a person in front of the speaker, *this* in *this hard* may be taken to have a kind of referential property, since it refers to the actual intensity with which the hearer pulls something. Whether the actual intensity of the action exhibited in front of the speaker is an entity or not is an intricate matter, though we take the intensity to be an actual entity in a non-linguistic world. If this analysis is on the right track, it follows that referential properties are not limited to D layers in DP, since in (66a) *this* adjoins to adverb *hard*, which itself serves as a VP adjunct. If so, whether an item is referential or not seems to depend on the lexical items used in the expression in question, rather than syntactical statuses of a particular phrase. A likely counterargument to this claim is that *this hard* in (66a) has a demonstrative *this*, which Chomsky (1995) suggest is decomposed into the initial part *th-*, which is a determiner in nature, and a latter part, which he believes is adjectival. If Chomsky's (1995) analysis is on the right track, it follows that one can claim *this hard* in (66a) can refer to an actual intensity of some action since it contains a kind of determiner. Thus, this observation seems to end in just confirming the view held in the literature that a determiner layer is associated with the referential property of a nominal phrase (e.g., Hiraiwa 2005, Alexiadou et al. 2007, among many others).

However, consider (66b) *you should not pull so hard*. If this example is uttered to the person in front of the speaker, *so hard* is also interpreted as referring to the actual intensity with which the hearer pulls something. In this regard, one can claim that *so hard* has some kind of referential property, since it refers to the actual intensity of the action exhibited in front of the speaker. In this case, it is obvious that *so* has no determiner layers, meaning that referential properties are not restricted to determiners. In the present case, the referential property originates in *so* and *so* modifies *hard* by Pair-Merging to it. Thus, we can claim that when an item with a referential property is Pair-Merged to some constituent XP, the resulting structure as a whole gains the referential property. In the present case *so hard* as a whole has gained the referential property, which has originated on *so*. Furthermore, *so hard* itself is Pair-Merged to a vP *pull*, forming a still larger vP *pull so hard*. Since the Pair-Merged item *so hard* has a referential property, the resulting verbal phrase itself seems

to have some kind of referential property, since it can be uttered to someone in front of the speaker who is pulling something hard. In other words, the verbal phrase *pull so hard* is tinged with a referential property, as it refers to the actual activity exhibited in front of the speaker. Thus, referential properties are not restricted to determiners. It turns out that Pair-Merging an item having a referential property to some constituent XP results in the attained structure as a whole gaining the referential property in question.

If this analysis is applied to the present nP analysis, a nominal phrase with a referential property is analyzed as follows. An item with a referential property can be adjoined (i.e., Pair-Merged) to an nP/n*P and the Pair-Merged item gives the entire nP/n*P a referential property by modifying the meaning of the nP/n*P. Therefore, a determiner layer is not an obligatory element for a nominal phrase to have a referential property.

A proper name like *Tom* and a pronoun like *he* can serve as potential counterexamples to the claim just outlined, since they can stand alone without determiners and refer to the entities in the real world. Within the analysis just outlined, a question arises about how these items refer to actual entities in the non-linguistic world, since these items usually lack adjuncts which modify the meanings of these items. Let us consider the case of proper names first. This phenomenon has been given an explanation in the framework of the DP hypothesis. Radford (2009, 2016) takes a phonologically null determiner \emptyset to be Merged in the determiner position of a proper name like *Tom*, giving rise to a structure of the form $\{\emptyset, \text{Tom}\}$. This structure mirrors other nominal constructions like $\{\text{the}, \text{city}\}$. He argues that the $\{\emptyset, \text{Tom}\}$ configuration receives its referential property from the phonologically null determiner, just like in the cases of other nominal constructions with phonologically overt determiners. Although plausible to some degree, this analysis is untenable for us, since we have advanced the nP hypothesis, where a nominal phrase is labelled as an nP, rather than a determiner phrase. This implies that a D element like a demonstrative is an optional constituent in a nominal phrase, rather than an obligatory element as is supposed in the DP hypothesis, since as we have already noted, a demonstrative is a kind of adjunct phrase Pair-Merged to an nP, and a determiner is actually a feature of a nominal phrase, spelled out separately from the core nominal (Chomsky 2019a.) Therefore, it is unreasonable for us to extend the null determiner analysis proposed in Radford (2009, 2016) to cover the present case.

There are two likely ways to address the present issue within the framework of the nP hypothesis. One is to assume that a referential property resides on the lexical root \sqrt{TOM} itself, and the other is to assume that a phonologically null adjunct is Pair-Merged to the nP,

providing the nominal phrase in question with its referential property, though ideally the latter analysis should be avoided. Since we have advanced a claim to the effect that a demonstrative is a kind of adjunct phrase and a determiner is a feature of a nominal phrase, thereby a demonstrative being an optional element and a determiner being not an element on its own, adopting the latter analysis, where an adjunct, be it phonologically overt or covert, is taken to be crucial for the referential property on a nominal phrase, is virtually the same as resurrecting the DP analysis; all nominals with referential properties need either phonologically overt or covert adjunct phrases. Although the adjunct phrase in question, be it phonologically overt or null, is taken to be phrasal, thus unqualified to provide a label for the entire nominal phrase, the latter analysis is reminiscent of the traditional DP hypothesis, in which the referential property of a nominal phrase is attributed to the D layer of the nominal in question. In the present case, the locus of the referential property has just shifted from a D layer to an adjunct phrase, though the gist of the both hypotheses is virtually the same. In this regard, we have mentioned that the latter analysis should be avoided. Therefore, we have no choice but to resort to the former analysis, in which a referential property of a proper noun like *Tom* resides in its lexical root \sqrt{TOM} . This analysis is rather ad hoc, because if we adopt this analysis, it follows that in the cases of proper nouns (and pronouns), their referential properties originate on their lexical root such as \sqrt{TOM} and \sqrt{HE} , whereas in the cases of other nominal phrases, their referential properties, if any, originate on adjunct phrases Pair-Merged to the nP/n*Ps. In this regard, the present analysis is unable to provide a uniform explanation for referential properties on nominal phrases. Furthermore, the analysis in question seems to be totally ad hoc since it attributes a referential property on a nominal to an adjunct phrase when the nominal phrase in question has one, and to the lexical root itself when the nominal phrase in question does not have one. However, the present analysis receives supports from both theoretical and empirical grounds. Recall that we have already claimed that a referential property of a nominal does not depend on its structural status but rather depends on the items employed in the nominal expression. If so, it is reasonable to suppose that the referential property is not restricted to adjunct phrases, but can reside in other elements. As there are only two items in a bare nP, i.e., a nominalizer n and a lexical root R, it is reasonable to suppose that either of them has an inherent referential property. The nominalizer n itself is unlikely to have any referential properties. If a nominalizer n itself has any referential property, it follows that every nP has its referential property, which is obviously an unpalatable prediction. If so, the sole possible candidate for the locus of a referential property of a nominal lacking an adjunct phrase is the

lexical root R itself. In this regard, the present analysis, though seemingly ad hoc, receives some theoretical support. Furthermore, the present analysis, when applied to the cases of pronouns like *he*, also receives empirical support¹⁷. For instance, we suppose that a pronoun *he* can refer to an actual person in the real world because the lexical root \sqrt{HE} has a referential property, thereby there being no need to assume a phonologically null determiner for the pronoun in question or the N-to-D movement operation advanced in Longobardi (1994), where a pronoun raises from the N position to the D position to acquire its referential property. This is because as a referential property is dissociated from the D layer, the nP needs not to raise to the D layer to acquire its referential property. Since the lexical root \sqrt{HE} itself has some kind of referential property, we predict that *he*, *him*, and *his*, all sharing the same lexical root \sqrt{HE} , have the same type of referential properties, and this prediction is borne out by empirical data; all of these items, i.e., *he*, *him*, *his*, can refer to an actual person in the real world, despite the fact that they have different forms. Since they have different forms, the internal structures of these items must be different other than the lexical root \sqrt{HE} . Therefore, the empirical fact that these items have the same type of referential properties supports our supposition that the lexical root \sqrt{HE} itself is equipped with its own referential property.

Summarizing this section, it turns out that referential properties on nominal phrases, long associated with D layers, are not restricted to D. Referential properties usually reside on items used in adjunct phrases, and by Pair-Merging such adjunct phrases to the nPs/n*Ps, the entire nominal phrase acquires referential properties. Although proper nouns and pronouns, being able to stand on their own without any modifying phrases and refer to entities in the real world, serve as potential counterexamples for our claims, this problem can be resolved by supposing lexical roots of these items have inherent referential properties.

¹⁷ Although Chomsky (2013a:46), citing Uriagereka (1988), suggests that a pronoun has an internal structure of the form {D, pro}, we put aside this analysis, since it seems that this analysis is based on the DP hypothesis. The prominent reason for rejecting this analysis is that we have confirmed that there is no such a thing as D. What we call D consists of a determiner, demonstrative, and so on. A determiner turns out to be a feature of an nP and a demonstrative an adjunct phrase (Chomsky 2019a:51). Furthermore, if we adopt this analysis, the symmetry between pronouns and other nominal phrases collapses, since although under the present analysis, the D serves as the head of a pronoun, other nominals have n/n* as their heads, rather than D.

2.8 A conclusion and likely counterarguments

Summarizing thus far, the present thesis builds on Chomsky's (2019a) insightful remark made in his UCLA lectures, quoted below.

I'm going to assume here that nominal phrases are actually NPs. The DP hypothesis, which is widely accepted, was very fruitful, leading to a lot of interesting work; but I've never really been convinced by it. I think these structures are fundamentally nominal phrases (Chomsky 2019a:51).

This far, we have followed him in claiming that a nominal phrase is indeed labelled nominal, rather than a determiner phrase, and confirmed Chomsky's (2007) intuition that the internal structure of a given nominal phrase mirrors that of a verbal phrase, rather than a CP. More precisely, we have remarked in the previous sections that the derivational steps of a transitive verbal construction (i.e., v*P in Chomsky's (2005) terminology) parallels those of a nominal phrase with its complement (i.e., n*P), whereas the derivational steps of an intransitive verbal construction (i.e., vP in Chomsky's (2005) terminology) corresponds to those of a nominal phrase without its complement (i.e., nP). This analysis is based on the argument structures of the nominal and verbal constructions, where vP and nP have only one argument each, which is the Internal Argument IA, whereas v*P and n*P are equipped with their complete argument structures (i.e., both Internal Arguments IA and External Arguments EA). Since derivational steps of nominal and verbal phrases match each other, we assume that a given verbal phrase has its corresponding nominal phrase with a matching argument structure. Therefore, we have proposed the theory just outlined, where v*P corresponds to n*P and vP to nP.

However, the presented theory contradicts Chomsky (2021:36f.57), where a transitive verbal phrase is argued to correspond to a specific nominal. This argument is based on the fact that both v*P and specific NP, he states, resist extractions. More specifically, Chomsky (2019a:52-53) states that an item can be extracted from an indefinite (non-specific) complex nominal phrase, whereas a definite (specific) nominal phrase strongly resists extraction. For illustration, consider the examples below. (The grammatical judgements are mine. Chomsky only mentions that there is a sharp contrast between these two examples.)

- (67) a. ?what did he believe the claims about (Chomsky 2019a:53)
b. what did he believe claims about (Ibid.)

Chomsky (2019a) states that the above examples have a sharp grammatical contrast and he attributes this contrast to the difference between the definiteness (specificity) of these nominal constituents. If we are to adopt this theory, the n/n* distinction should be based on the definiteness (specificity) of a nominal phrase, rather than on the argument structure of a nominal phrase. There are parallelisms on extractabilities between verbal phrases and nominal phrases; v* and a definite (specific) nominal phrase resist extractions, whereas v and an indefinite (non-specific) nominal do not. If so, it is reasonable that this parallelism of extractabilities between nominal and verbal constituents should be captured by the n/n* distinction. This serves as a likely counterargument to our claim.

Although this observation on extractability, stemming from Chomsky (1973, 1977), is appealing to some degree and thereby should be pursued in analyzing nominal phrases, we stick to our original analysis, as the parallelism in question is impossible to apply to the actual analysis of nominal and verbal structures. If Chomsky's (2019a, 2021) observation is on the right track, it follows that the internal structure of a v*P mirrors that of a specific (definite) NP, rather than our n*P, and the internal structure of a vP mirrors that of a nonspecific (indefinite) NP, rather than our nP. If so, a problem arises as to how to analyze the actual constructions; we see no correlation between internal structures of a specific (definite) NP and a transitive verbal construction (i.e., v*P), and the same applies to the case of a vP and a non-specific (indefinite) NP. Since v*P is a verbal construction with a full argument structure (Chomsky 2005, 2007), the internal structure of a specific (definite) NP, being the derivational counterpart of a v*P, is expected to have a corresponding argument structure. Furthermore, an indefinite (non-specific) NP, being a derivational counterpart of vP, is expected to have only one argument, since vP has an argument structure such that its sole argument is its Internal Argument IA (see Chomsky 2005, 2007). However, our predictions are not born out since whether a given NP is specific or non-specific does not depend on its argument structure. For illustration, reconsider examples in (67). *claims* is an indefinite (non-specific) NP and *the claim* is a definite (specific) NP. These two NPs have exactly the same argument structures. (Since *the* in *the claim* is a mere feature, spelled out separately from the core nominal phrase (Chomsky 2019a), it does not serve as an "External Argument".) Thus, we see no structural correlation between v*P and a definite (specific) NP, and the same applies to the vP and an indefinite (non-specific) NP pair. In this respect, we stick to our original analysis, where a v*P and vP correspond to nominal phrases with their matching argument structures.

We are then faced with a problem as to how to label the {D, nP} configuration. To overcome this difficulty, we have followed Chomsky (2019a) in claiming that a determiner is a

feature of a nominal phrase, spelled out separately from the nominal phrase, and a demonstrative is a phrasal constituent, Pair-Merged to a nominal phrase as an adjunct phrase. Since a determiner is a feature of a nominal phrase, in the case of {the, nP}, the D layer does not exist in narrow syntax or the CI interface. Thus, the determiner is not qualified as a candidate for a label. Therefore, the attained structure is labelled nP. In the case of {demonstrative, nP}, the structure is labelled nP, since a demonstrative is an adjunct phrase and an adjunct phrase is always invisible to the labelling algorithm. In this fashion, we have overcome the labelling issue.

Adopting an adjunct analysis raises a new issue. Since Pair-Merge is dissociated from theta-role assignments, a constituent which is interpreted as the agent of the activity described in the nominal phrase is not the genuine argument of the nominal phrase in a strict sense. For instance, *the enemy* in *the enemy's destruction of the city* is interpreted as the performer of the activity of destroying the city, thereby seemingly having the agentive theta-role. However, the n*P *destruction of the city* does not assign an agentive semantic role to *the enemy*, since *the enemy's* is Pair-Merged to the nominal phrase *destruction of the city*. The reading in which *the enemy* is interpreted as the agent of the action described in the n*P is made possible by an interpretation rule, in which a constituent which looks like an agent to the CI interface is interpreted as the agent of the action described in the n*P. By this fashion, we have overcome difficulties associated with our nP hypothesis.

We have also considered referential properties on nominal phrases. Although a referential property of a nominal phrase has long been associated with the D layer of the nominal phrase, we have shown that a referential property is not restricted to the D layer. We suppose that in most cases, a referential property resides on a lexical item used in an adjunct phrase. Pair-Merging this lexical item to some XP makes the resulting structure gain the same referential property. On the other hand, we have advanced a rather ad hoc claim that proper names and pronouns have referential properties because they have lexical roots which have their own referential properties. Although this analysis is rather ad hoc, we have no choice but to adopt this hypothesis.

In light of the analyses discussed thus far, we conclude that a nominal phrase is indeed nominal, rather than a determiner phrase. As the last comment, we need to consider a case cited by Radford (2016), which has been left unexplained. Radford (2016) cites *the government ban on imports* as a piece of supporting evidence for the DP hypothesis. He argues that *government* is positioned in the specifier of the NP and the determiner *the* serves as the head of the entire structure. Therefore, he supposes that the entire structure is a determiner

phrase headed by the determiner *the*. However, we argue that the example in question can be analyzed as having the internal structure of the form $\{\{\text{the, government}\} \{\text{ban on imports}\}\}$, where *the government* is a constituent which is Pair-Merged to the n*P *ban on imports* as an adjunct phrase. Therefore, the label of the entire structure is n*P. In this respect, this kind of example does not threaten our nP hypothesis.

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