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Labeling and Phonological Phrasing: A Preliminary Study*

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ABSTRACT. In this paper, I propose a theory of phonological phrasing based on the interpretation of syntactic objects SOs. The proposed theory departs from the Multiple Spell-Out theory of phonological phrasing that has been, more or less, central to the study of syntax-phonology interface for the last decade. I suggest that an SO with an unlabellable element that is detectable with minimal search is interpreted as a phonological phrase. This approach can not only carry on the empirical consequences of the phase-based approach, but also provide a new perspective on the parametric variation of complementizer-trace effect and phonological phasing in Bantu applicative constructions. I also argue that Case markers in Japanese and conjunctions have an effect on prosody because they are unlabellable.

Keywords: labeling algorithm, syntax-phonology interface, phonological phrasing, externalization

1. Introduction

Since Chomsky (2000) proposed a phase theory incorporating Multiple Spell-Out (cf. Uriagereka 1999), Spell-Out domains have often been considered to correspond to phonological phrases (Seidl 2001, among many others). Recent syntactic researches, however, reveal that Spell-Out domains may vary in accordance with the inheritance of phasehood (e.g. Chomsky 2015), indicating that they would no longer be taken as phonological phrases. Moreover, it has been pointed out, from the outset of the phase-based theory, that systematic mismatches are observed between a Spell-Out domain (i.e., phase-head complement) and a phonological phrase (Dobashi 2003, Fuß 2007).[1] Applied to the complements of phase heads v* and C, Spell-Out creates the domains shown in (1b), while the attested phonological phrasing is shown in (1c), where Subj is phrased with C but not with T:

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[1] Various phase-based approaches to phonological phrasing have been proposed: some argue that the entire phase (such as CP or v*P) is a phonological phrase (e.g. Ishihara 2003, 2007), others argue that the complement of a phase-head is a phonological phrase (e.g. McGinnis 2001), and still others argue that phonological phrases are determined in terms of phase edges (e.g., Cheng and Downing 2016). This variety might have been a sign that apparent correlation between a Spell-Out domain and a phonological phrase was just an illusion. For a review of recent development of the study of syntax-phonology interface, see Dobashi (2014).

(1) a. Syntax: [$_{CP}$ **C** [$_{TP}$ Subj T [$_{vP}$ YP V-**v*** [$_{VP}$ t_V Obj]]]]
b. Spell-Out: (C) (Subj T YP V-v*) (t_V Obj)
c. Phonology: { C Subj}{T YP V-v* t_V }{ Obj }

This mismatch requires an additional mechanism that adjusts Spell-Out domains to the actual phonological phrases.

This preliminary study explores a new approach to phonological phasing, within the theory of labeling algorithm LA (Chomsky 2013, 2015). Specifically, I argue that a syntactic object SO that has an unlabellable element that is detectable with minimal search is interpreted as a phonological phrase in the processes of externalization (i.e., the phonological component Φ). I show that this new approach can dispense with additional adjustment mechanisms that were needed for the phase theory of phonological phrasing. I also show that it accounts for (i) a cross-linguistic difference in complementizer-trace effects, (ii) a cross-linguistic difference in phonological phrasing of applicative constructions in Bantu languages, (iii) an effect of Case suffix on phonological phrasing in Japanese, and (iv) an effect of conjunctions on prosody, all of which would not be adequately accounted for in the phase-based theory of phonological phrasing.

This paper is organized as follows. In section 2, I review the labeling theory. In section 3, I propose a label-based theory of phonological phrasing. In section 4, I discuss some empirical consequences that are mentioned above. In section 5, I consider two theoretical issues: one is concerned with prosodic categories other than phonological phrase, and the other is about theoretical details of subsequent labeling. Section 6 concludes the paper.

2. Labels and Labeling Algorithm

Chomsky (2013, 2015) proposes the following labeling algorithm:

(1) *Labeling Algorithm* (Chomsky 2013[POP]: 43):

> "We assume, then, that there is a fixed labeling algorithm LA that licenses SOs so that they can be interpreted at the interfaces, operating at the phase level along with other operations."

He argues that LA is a minimal search operation, and discusses the following three cases of labeling:

(2) a. H is the label in {H, XP}
b. The label of YP is the label of K in (i):
(i) $\underline{XP}$ . . . {$_K$ $\underline{XP}$, YP}
c. The most prominent feature shared by XP and YP is the label of K in (ii):
(ii) {$_K$ XP, YP}

Note that the first Merge in a derivation creates an SO of the form {H, H}, which does not fall within (2). But such an SO in fact takes the form of {*f*, R}, where *f* is a functional element and R is a root. Chomsky argues that R does not qualify as a label (Chomsky 2013:47; 2015:8), and {*f*, R} is unambiguously labeled *f*. In addition, given the parallelism between the two phases CP and v*P, Chomsky (2015:9) argues that not only R but also T is too weak to serve as a label:[2]

(3) a. R is too weak to serve as a label.
b. T is too weak to serve as a label.

Given these assumptions, let us consider the derivation of a simple transitive construction:

(4) *The man can hit the thief.*

a. $\{n, R_{thief}\}$
$\rightarrow$ n

b. $\{the, \{n, R_{thief}\}\}$
$\rightarrow$ *the*

c. $\{_{\alpha}\ R_{hit},\ \{the, \{n, R_{thief}\}\}\}$
$\rightarrow$ **α = ??**

d. $\{\ R_{hit}\text{-v*}, \{_{\alpha}\ t_{R_{hit}},\ \{the, \{n, R_{thief}\}\}\}\}$
$\rightarrow$ v*

e. $\{_{\beta}\{the, man\}, \{\ R_{hit}\text{-v*}, \{_{\alpha}\ t_{R_{hit}},\ \{the, \{n, R_{thief}\}\}\}\}\}$
$\rightarrow$ β = ??

f. $\{_{\gamma}\ can\text{-T}, \{_{\beta}\{the, man\}, \{\ R_{hit}\text{-v*}, \{_{\alpha}\ t_{R_{hit}},\ \{the, \{n, R_{thief}\}\}\}\}\}\}$
$\rightarrow$ **γ = ??**

g. $\{_{\delta}\ \{the, man\}, \{_{\gamma}\ can\text{-T}, \{_{\beta}\ t_{the\text{-}man},\ \{\ R_{hit}\text{-v*}, \{_{\alpha}\ t_{R_{hit}},\ \{the, \{n, R_{thief}\}\}\}\}\}\}\}$
$\rightarrow$ β= v*,
δ = ??

h. $\{_{\varepsilon}\ C, \{_{\delta}\ \{the, man\}, \{_{\gamma}\ can\text{-T}, \{_{\beta}\ t_{the\text{-}man}, \{\ R_{hit}\text{-v*}, \{_{\alpha}\ t_{R_{hit}},\ \{the, \{n, R_{thief}\}\}\}\}\}\}\}\}$
$\rightarrow$ ε = C,
δ = <φ, φ>

Although we do not go into the details of each step of derivation, it should be noted that the SOs α and γ in (4) are not labeled since minimal search detects R_{hit} and T that do not qualify as labels. Chomsky (2015:10) argues that they are labeled "after" strengthening by SPEC-T and SPEC-R, but let us consider for the moment what consequences we would have for phonological interpretation if the SO with an unlabellable T or R is actually not labeled (at

[2] I will discuss "strong" T in section 4.1.

least at the point of phonological interpretation[3]). The reader might have already noticed that the unlabelled SOs α and γ in (4) correspond to the domain of phonological phrase containing Obj and that containing T, YP and V-v in (1c), respectively. In the next section, I will argue that the phonological phrasing in (1c) can in fact be derived from the prosodic interpretation of SOs in Φ, without recourse to Spell-Out.

3. Interpretation in the Processes of Externalization

It has long been observed that function words or functional elements are invisible, and that only content words or lexical elements are visible, in the computation of post-syntactic phonology (Chomsky and Hallle 1968: 366, Selkirk 1984: 337, Truckenbrodt 1999: 226). Thus, the following condition has been proposed, where "rules" refer to phonological rules:

(5) *The Principle of the Categorial Invisibility of Function Words* (Selkirk 1984: 337)
"... rules making crucial appeal to the syntactic category of the constituents to which they apply are blind to the presence of function word constituents."

This is the exact opposite of (3), which states that R and T cannot serve as labels. R basically corresponds to a content word, and T (weak T, in this case) is "weakly" functional and is more or less like a content word as far as labeling is concerned. That is, elements that do not qualify as labels in syntax would be actually "visible" in the phonological component, given (5). Let us formulate this asymmetry as follows:[4]

(6) *Syntax-Phonology Asymmetry (SPA):*
Syntactically inert elements receive interpretation in the processes of externalization Φ.

I assume that R and weak T are syntactically inert in that they do not qualify as labels.[5]

Given (6), let us consider the derivation of (4) again, the final stage of which is repeated schematically here in (7), with irrelevant parts omitted:

(7) $\{_{C}$ C, $\{_{<\varphi, \varphi>}$ Subj, $\{_{\boldsymbol{\gamma}}$ T, $\{_{v^*}$ t_{Subj}, $\{_{v^*}$ R-v*, $\{_{\boldsymbol{\alpha}}$ t_{R_V}, Obj$\}\}\}\}\}$

Here, unlabelled SOs, α and γ, are identifiable in Φ since they have an unlabellable element (T, R) that is detectable with minimal search.[6] Suppose that such SOs are interpreted as phonological phrases:

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[3] I will discuss the timing of phonological interpretation in section 5.2.

[4] Nasukawa and Backley (2015) observe other types of syntax-phonology asymmetries. They point out that head-dependent relations are reversed in syntax and phonology. Thus in a VP like "drink coffee", *drink* is a head in syntax (i.e., a structural head) while *coffee* is a head in phonology (i.e., an informational head) in that it receives prominence.

[5] I will argue in section 5.1 that the notion of syntactic inertness in (6) is also relevant to other prosodic categories (i.e., prosodic words and intonational phrases), and that it provides a uniform account of the entire prosodic hierarchy.

(8) An SO with the unlabellable element that is detectable with minimal search is interpreted as a phonological phrase.

On the assumption that prosodic interpretation goes along with syntactic cycle (Chomsky 2001), I suggest the following rendering of prosodic cycle based on phases:

(9) An unlabeled SO receives a prosodic interpretation when its containing phase is complete.

Given (8) and (9), let us consider the derivation of (7) in more detail, paying attention to the timing of prosodic interpretation:[7]

(10) a. NS: $[_{\alpha}$ R Obj]
Φ:
b. NS: $[_{\beta}$ Subj $[_{v*}$ R-v* $[_{\alpha}$ t_R Obj]]]]
Φ: { Obj$\}_{\varphi}$
c. NS: $[_C$ C $[_{<\varphi, \varphi>}$ Subj $[_{\gamma}$ T $[_{\beta}$ t_{Subj} $[_{v*}$ R-v* $[_{\alpha}$ t_R Obj]]]]]]
Φ: { T R-v* ___ $\}_{\varphi}$
d. Φ: {T R-v$\}_{\varphi}$ {Obj$\}_{\varphi}$
e. NS $[_C$ C $[_{<\varphi, \varphi>}$ Subj $[_{\gamma}$ T $[_{\beta}$ t_{Subj} $[_{v*}$ R-v* $[_{\alpha}$ t_R Obj]]]]]]
Φ: { C Subj ___ ___ ___ $\}_{\varphi}$
f. Φ: {C Subj$\}_{\varphi}$ {T R-v$\}_{\varphi}$ {Obj$\}_{\varphi}$

Here NS = narrow syntax, Φ = phonological component. The SO α in (10a) has an unlabellable R that is detectable with minimal search, but it does not receive a prosodic interpretation at this point under (9). If α were interpreted at this stage of derivation, the verbal root R, which will undergo internal merge later, would be interpreted here, and R and Obj would be in the same phonological phrase, contrary to fact. In (10b), v*P phase is complete with R internally merged with v and Subj externally merged. This is the stage where a prosodic interpretation is given under (9): α is interpreted as a phonological phrase containing just Obj, as in the second line of (10b). The derivation goes on to the root of the sentence. At this point, CP phase is complete, and the unlabeled SO contained in it (i.e., γ) is interpreted as a phonological phrase, as in (10c). This phonological phrase and the one in (10b) are then put in order, as in (10d). At this stage, C and Subj remain to be "parsed." I assume that these remnants form a phonological phrase, as a last resort, along the line of something like an OT constraint EXHAUSTIVITY (Selkirk 1995, Truckenbrodt 1999) requiring

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[6] I would like to thank Hisatsugu Kitahara for helpful comments on this point.

[7] Following Chomsky (2001), I assume that the domain of a phase head becomes inaccessible at the next higher phase. Thus in (10b), α is still accessible to phonological interpretation. See section 5.2 for more discussion of the timing of phonological interpretation, inheritance, and labeling.

that parsing on each prosodic level (here the phonological-phrase level) must be exhaustive, so that all the elements must be included in some phonological phrase. The most "economical" way to satisfy EXHAUSTIVITY is to include both C and Subj in one phonological phrase but not in two (or more).[8] Therefore, a phonological phrase containing C and Subj is formed as in (10e), and it is put together with the other phrases that have already formed, as in (10f).[9]

Note that recent syntactic inquiries show that phasehood of C/v* can be inherited by T/R_V, and the domain of Spell-Out will be the complement of T/R_V but not that of C/v* (e.g. Chomsky 2015, Epstein, Kitahara and Seely 2016). If so, we cannot maintain the theory of phonological phrasing assuming that phases are invariably CP and v*P and that their complements are spelled-out. In the present approach, Φ does not require Spell-Out for phonological phrasing, but rather it "reads" an SO with an unlabellable R/T that is detectable with minimal search. Furthermore, as pointed out in Dobashi (2016), the assumption that a Spell-Out domain = a prosodic domain turns out to be an arbitrary stipulation in that it does not account for the whole architecture of prosodic hierarchy consisting of three (or perhaps more) prosodic categories. We will return to these theoretical issues in section 5.

The present approach can also take over the empirical consequences discussed in Dobashi (2003) without any additional complication, including those for cross-linguistic variation in phonological phrasing. In addition, it has a wider range of empirical consequences, as we will see in the next section.

4. Consequences

4.1 Unlabellable T

In discussing the status of "weak" T in section 3, one might have wondered how strong T would behave in Italian-type languages with rich agreement. If T is strong, γ will be labeled in (7), repeated here, whether Subj is in Spec-T or not. Then the phonological phrasing would be like (11a), rather than (11b) that is actually attested (see Nespor and Vogel 1986 for phonological phrasing in Italian):

(7) $\{_{C}$ C, $\{_{<\varphi,\,\varphi>}$ Subj, $\{_{\boldsymbol{\gamma}}$ T, $\{_{v^*}$ t_{Subj}, $\{_{v^*}$ R-v*, $\{_{\boldsymbol{\alpha}}$ t_{R_V}, Obj$\}\}\}\}\}$

(11) a. $^{\#}\{$C Subj T R-v$\}_{\varphi}$ $\{$Obj$\}_{\varphi}$

b. $\{$C Subj$\}_{\varphi}$ $\{$T R-v$\}_{\varphi}$ $\{$Obj$\}_{\varphi}$

[8] This is in accordance with an OT constraint *P-PHRASE, which seeks to avoid creating a phonological phrase (Truckenbrodt 1999: 228).

[9] It might be theoretically interesting to see that α and γ correspond to T-bar and V-bar (intermediate projections) in the X-bar theory (Chomsky 1986). They do not seem to receive an interpretation at C-I, nor do they undergo any syntactic operation, but they receive an interpretation in Φ if the current approach is correct.

In order to address this issue, let us consider the comlementizer-trace effect in English and Italian. As is well known, Italian-type *pro*-drop languages do not show the comlementizer-trace effect, unlike English (Perlmutter 1968). Let us first consider English. Sato and Dobashi (2016) suggest that the *that*-trace effect in English can be accounted for in terms of prosody. They argue that the invisibility of function words in prosody, mentioned in (5) above, implies (12):

(12) A phonological phrase φ must contain at least one content word.

That is, a phonological phrase may not consist of just (a) function word(s). Then the complementizer *that*, being a function word, may not constitute a phonological phrase alone:

(13) *{ *that* }$_{\varphi}$

This analysis can be carried over to the present approach in the following way. First, let us consider the derivation of (14), where a *wh*-object is extracted and no *that*-trace effect is observed:

(14) What$_i$ do you think that John bought t_i ?

(15a) and (15b) illustrate the syntactic derivation and its phonological interpretation:

(15) a. what do you think {$_{\varepsilon}$ **C**, {$_{<\varphi, \varphi>}$ **Subj**, {$_{\gamma}$ T, {$_{\beta}$ t_{Subj}, { **R**-v*, {$_{\alpha}$ t_R, t_{Obj} }}}}}}

b. what do you think { that John }$_{\varphi}$ { bought }$_{\varphi}$ { __ }$_{\varphi}$

↑ Prosodic boundary ↑ Prosodic boundary

Since English T is weak, γ is not labeled, and a prosodic boundary is created between *John* and *bought*. Then, the feature-sharing between Subj and T assigns a label (<φ, φ>) to the complement of C, which does not create a prosodic boundary. As a result, *that* and *John* are phrased together, and (13) is satisfied.

By contrast, in (16), a *wh*-subject is extracted from the embedded clause crossing the complementizer *that*, resulting in ungrammaticality, a typical instance of the *that*-trace effect:

(16) *Who$_i$ do you think that t_i bought the apple?

In the same vein as (15), a prosodic boundary is created in the position of γ, which is unlabeled:

(17) a. who do you think {$_{\varepsilon}$ **C**, {$_{<\varphi, \varphi>}$ t_{Subj}, {$_{\gamma}$ T, {$_{\beta}$ t_{Subj}, { **R**-v*, {$_{\alpha}$ t_R, **Obj** }}}}}

b. who do you think *{ that ____}$_{\varphi}$ { bought}$_{\varphi}$ { the apple}$_{\varphi}$

↑ ↑
Prosodic boundary Prosodic boundary

In contrast to (15), (17) violates (13) since the *wh*-subjet *who* has moved out, and *that* constitutes a phonological phrase alone.

Now, let us consider Italian-type languages with rich agreement, where T labels γ. In Italian, the verb or R moves to T via v. Suppose that an embedded *wh*-subject is extracted across a complementizer just like the English example (17), as schematically shown in (18), with English glosses:

(18) ---------- $\{_{\varepsilon}$ **C**, $\{_{<\varphi, \varphi>}$ t_{Subj}, $\{_{\gamma}$ **R**-v*-T, $\{_{\beta}$ t_{Subj}, { $t_{R\text{-}v*}$, $\{_{\alpha}$ t_R, **Obj**$\}\}\}\}\}$
---------- { that ___ bought $\}_{\varphi}$ { **Obj**$\}_{\varphi}$
↑ ↑
No prosodic boundary Prosodic boundary

Since T is strong enough to serve as a label, γ is labeled T. Given (8), γ fails to be interepreted as a phonological phrase. Then, as illustrated in (18), no prosodic boundary is created between "*that*"and "*bought*". That is, these are phonologically phrased together in Italian, observing (13):

(19) $\{$ that bought $\}_{\varphi}$

In this way, the lack of complementizer-trace effect in *pro*-drop languages can be accounted for in terms of labeling and prosody. "Strong" T does not cause a problem for the present labeling approach to phonological phrasing, but rather it offers an additional support. Furthermore, Sato and Dobashi's (2016) prosodic analysis of other complicated English data can also be maintained in this approach.

Then, what if the subject is overt in Italian? If Alexiadou and Anagnostopoulou (1998) are correct, subject in Italian is in fact in an A-bar position, interpreted as a topic. Suppose that this is correct, and subject stays in Spec-TOP, as follows:

(20) [C $[_{<TOP, TOP>}$ Subj [TOP $[_{<\varphi, \varphi>}$ *pro*/t_{Subj} $[_T$ R-v*-T $[_v$ t_{Subj} $t_{R\text{-}v*}$. . .

Suppose also that TOP is too weak to serve as a label. Then we have the following syntactic derivation and phonological phrasing:

(21) a. [C $[_{<TOP, TOP>}$ Subj $[_{??}$ TOP $[_{<\varphi, \varphi>}$ *pro*/t_{Subj} $[_T$ R-v*-T $[_v$ t_{Subj} $t_{R\text{-}v*}$ $[_{??}$ t_R . . .
b. { C Subj $\}_{\varphi}$ { R-v-T $\}_{\varphi}$
↑ ↑
Prosodic boundary Prosodic boundary

In (21a) "??" indicates that the SO is not labeled. A prosodic boundary is created between the topicalized subject and the verb (R-v*-T) since TOP does not serve as a label as in (21a).[10] As observed by Nespor and Vogel (1986), among many others, the basic phonological phrasing in Italian conforms to the phrasing in (21b).

So far, I have argued that the labellability of strong/weak T has a consequence for the parametric difference between English-type and Italian-type languages concerning the complementizer-trace effect.

4.2 Unlabellable R

In the previous section, we have discussed T and its effect on phonological phrasing. In this section, let us consider an unlabellable verbal root R, paying attention to applicative constructions in Bantu languages.

Bresnan and Moshi (1990) point out that Bantu languages can be divided into two types, with respect to the syntax of applicative constructions. One is symmetric type languages, where either of the two internal arguments can be passivized and show object agreement. The other is asymmetrical type languages, in which only indirect object can be passivized and mark object agreement. Seidl (2001) observes that there is a correlation between these language types and phonological domains. She points out that two internal arguments are phrased together in the symmetrical type while they are phrased separately in the asymmetrical type. The following table is adapted from Seidl (2001: 89):

(22)

LANGUAGE	SYNTAX	PROSODIC DOMAIN
Kikuyu	Symmetric	$\{V\ NP\ NP\}_{\varphi}$
Kinyarwanda	Symmetric	$\{V\ NP\ NP\}_{\varphi}$
Kinande	Symmetric	$\{V\ NP\ NP\}_{\varphi}$
Runyambo/Kinyambo	Symmetric	$\{V\ NP\ NP\}_{\varphi}$
Haya	Symmetric	$\{V\ NP\ NP\}_{\varphi}$
Xhosa	Symmetric	$\{V\ NP\ NP\}_{\varphi}$
Chimwiini	Asymmetric	$\{V\ NP\}_{\varphi}\{NP\}_{\varphi}$
Kiswahili	Asymmetric	$\{V\ NP\}_{\varphi}\{NP\}_{\varphi}$

Following Seidl (2001), McGinnis (2001) proposes that this correlation can be accounted for by assuming that a Spell-Out domain meets a phonological phrase. McGinnis (2001: 132) argues that symmetrical languages have a high applicative phrase ApplHP between v*P and

[10] Frascarelli (2000), among others, observe that topic phrases generally form independent intonational phrases in many languages.

VP, and that asymmetrical languages have a low applicative phrase ApplLP below VP (see also Pylkkänen 2008):

(23) a. High applicative (Symmetric)

$[_{v*P}$ EA v* $[_{ApplHP}$ IO $[_{ApplH'}$ DO ApplH $[_{VP}$ V t_{DO}]]]]

b. Low applicative (Asymmetric)

$[_{v*P}$ EA $[_{v'}$ IO v* $[_{VP}$ V $[_{ApplLP}$ t_{IO} $[_{ApplL'}$ ApplL DO]]]]

Here EA is an external argument, and V corresponds to R. In (23a), ApplH takes VP as its complement, DO base-generated in the complement of V moves to the inner Spec of ApplHP, and IO is base-generated in ApplHP. In (23b), ApplLP is the complement of V, DO is the complement of ApplL, and IO is base-generated in Spec-ApplLP and moves to Spec-v*P. Given these structures, McGinnis (2001: 111) proposes that the phasehood within v*P is defined in the following way:

(24) The sister of VP heads a phase if an argument is generated in its specifier.

Thus ApplHP in (23a) and v*P in (23b) are phases. On the assumption that the phase-head complement undergoes Spell-Out, VP is spelled-out in both constructions (Spell-Out domains are bold-faced and underscored below):

(25) a. High applicative (Symmetric)

$[_{v*P}$ EA v* $[_{ApplHP}$ IO $[_{ApplH'}$ DO ApplH $\underline{\mathbf{[_{VP}\ V\ t_{DO}\ ]}}]]]$

b. Low applicative (Asymmetric)

$[_{v*P}$ EA $[_{v'}$ IO v* $\underline{\mathbf{[_{VP}\ V\ [_{ApplLP}\ t_{IO}\ [_{ApplL'}\ ApplL\ DO]]]}}]$

Assuming that EA as well as V and ApplL/H move up to a higher position, Spell-Out gives the following phonological phrasing, where IO and DO are phrased together in symmetric languages while they are phrased separated in asymmetric languages:[11]

(26) a. High applicative (Symmetric)

$\{V\ NP\ NP\}_{\varphi}$

b. Low applicative (Asymmetric)

$\{V\ NP\}_{\varphi}\{NP\}_{\varphi}$

McGinnis argues that the definition of phases in (24) accounts not only for this asymmetry in phonological phrasing but also for other syntactic phenomena, including object agreement and locality of movement within v*P. But (24) does not seem to be without a problem, since

[11] Neither Seidl (2001) nor McGinnis (2001) discusses the phonological phrasing of EA.

it is category-specific (referring only to VP), and it raises a question of why CP can be a phase even when its specifier is empty.

In the present labeling approach, the phrasing in (26) follows straightforwardly, with McGinnis's syntactic analysis of verb phrase intact. Moreover, the phrasing above a phase, which is not discussed in McGinnis (2001), can also be accounted for (see footnote 11). That is, we can explicitly account for why V is phrased with the following NP. Let us first consider the high applicative (symmetric) construction:

(27) High applicative (Symmetric)

$[_{CP}$ C $[_{TOPP}$ EA $[_{TOP'}$ TOP $[_{TP}$ t_{EA} T $[_{v*P}$ t_{EA} v* $[_{ApplHP}$ IO $[_{ApplH'}$ DO ApplH $[_{VP}$ V t_{DO}]]]]]]]]

I assume, on par with Italian, that Bantu T is strong enough to serve as a label, and that EA occupies Spec-TOP, like Italian, since subject in Bantu tends to be interpreted as topic (see, e.g., Bresnan and Mchombo 1987). Note, in passing, that Bantu languages seem to lack complementizer-trace effects. The following example is from Lubukusu:

(28) naanu ni-ye ba-many-ie ?(ba-li) a-a-kula ka-ma-tunda
1who PRED-1 2S-know-PRF 2-COMP 1S-PST-buy 6-6-fruit
'Who do they know (that) bought fruit?' (Diercks 2010: 188 (164))

Diercks (2010: 188) observes that "the complementizer is clearly preferred to be present, resulting in marginality otherwise."

In (27), the SOs corresponding to "TOP′" and "VP" are unlabeled and they have unlabellable elements, TOP and V (=R), respectively, which are detectable with minimal search, just as in Italian example (21) above, and prosodic boundaries are inserted there, as shown below. Note that ApplH can be a label since it is a functional element (CP is omitted here for reasons of space):

(29) High applicative (Symmetric)

$[_{TOPP}$ EA $[_{TOP'}$ TOP $[_{TP}$ t_{EA} V-Appl-v*-T $[_{vP}$ t_{EA} t_{v*} $[_{ApplHP}$ IO $[_{ApplH'}$ DO t_{ApplH} $[_{VP}$ t_{V} $t_{DO}]]]]]]]$

{ EA $\}_{\varphi}$ { V IO DO $\}_{\varphi}$ { $\}_{\varphi}$

↑ ↑

Prosodic boundary Prosodic boundary

Here, V, IO and DO are phrased together, as expected.

In contrast to symmetrical type languages, a prosodic boundary is created between IO and DO in asymmetrical languages. I assume that these languages, too, have strong T and that EA occupies Spec-TOP:

(30) Low applicative (Asymmetric)

$[_{CP}$ C $[_{TOPP}$ EA $[_{TOP'}$ TOP $[_{TP}$ t_{EA} T $[_{vP}$ t_{EA} $[_{v'}$ IO v $[_{VP}$ V $[_{ApplLP}$ t_{IO} $[_{ApplL'}$ ApplL DO]]]]]]]]]

Again, "TOP′" and "VP" are unlabeled, and prosodic boundaries are inserted there:

(31) Low applicative (Asymmetric)

$[_{\text{TOPP}}$ EA $[_{\text{TOP}'}$ TOP $[_{\text{TP}}$ t_{EA} Appl-V-v-T $[_{\text{vP}}$ t_{EA} $[_{\text{v}'}$ IO t_{v} $[_{\text{VP}}$ t_{V} $[_{\text{ApplLP}}$ t_{IO} $[_{\text{ApplL}'}$ t_{ApplL} DO]]]]]]]

$\{$ EA $\}_{\varphi}$ $\{$ V IO $\}_{\varphi}$ $\{$ DO $\}_{\varphi}$

↑ ↑

Prosodic boundary Prosodic boundary

So far we have seen that the object asymmetries in phonological phrasing receives a straightforward account in the present approach, without recourse to the definition of phases in (24).[12,13]

4.4 Other Unlabellable Elements

In the previous sections, we have discussed typical unlabellable elements, weak T and R, and shown that an SO with weak T or R detectable with minimal search is interpreted as a phonological phrase. In this section, we will discuss two other (possible) unlabellable elements, i.e., Case-marker in Japanese and conjunction Conj, and argue that they also make an SO interpretable in Φ.

4.4.1 Unlabellable Case-marker in Japanese

In this section, I consider Case suffix in Japanese. Saito (2016) argues that Case marker serves as an anti-labeling device, and it makes a constituent to which it attaches invisible for labeling. Thus in (31), the Case marker prevents α from labeling γ, and β provides the label of γ.

(31) $\{_{\gamma}$ α-Case, β$\}$

This proposal explains why Japanese allows DP-scrambling and multiple nominative constructions. DP-scrambling is allowed because "DP-Case" does not label an SO so that it can freely merge with TP or CP, without inducing an XP-YP problem. If it merges with XP, creating α = [DP-Case XP], the label of α is unambiguously the label of XP. Moreover, assuming that Case valuation and phi-feature agreement can be dissociated (Bošković 2007),

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[12] As McGinnis (2001: 134) points out, the correlation shown in (22) is not without exception. Chichewa is syntactically an asymmetrical type language, but its two internal arguments in applicative constructions are phonologically phrased together. McGinnis points out that a Chichewa benefactive has the semantic properties of high applicative, and argues that the syntactic asymmetry results because Chichewa does not allow DO-IO order in Specs of ApplHP, unlike other symmetric languages, so that IO cannot move over DO to the subject position.

[13] See Cheng and Downing 2016 for a more recent approach to phonological phrasing in symmetrical languages, which is based on phase edges.

Saito argues that multiple nominative constructions are allowed because two or more DPs in Spec-T can probe for T, and Case is valued as Nominative, without causing an XP-YP problem:

(32) $[_{\gamma}$ DP-Case $[_{\beta}$ DP-Case $[_{\alpha}$ DP-Case [T<NOM> . . .

Since Case marker is an anti-labeler, α, β and γ are all labeled T.

Building on the notion of anti-labeling, let us assume that Case-marker is a "head" K, taking a DP as a complement (cf. Narita 2014):

(33) $[_{\alpha}$ DP K]

Suppose that α is not labeled, due to the anti-labeler K. Since α lacks a label, it cannot be the label of an SO immediately containing it, either. Thus, the label of {α, XP} is that of XP. Notice that K is unlabellable but detectable with minimal search within α. Then it is expected that α is interpreted as a phonological phrase. As is observed by McCawley (1968), among many others, an accented word plus a Case marker constitute a prosodic domain called Minor Phrase or Accentual Phrase in Japanese. Ishihara (2015: 572) observes the following example, an accusative DP containing two genitive DPs:

(34) Na'oya-no a'ni-no wa'in-o
Naoya-GEN big.brother-GEN wine-ACC
'Naoya's big brother's wine ACC'

Here, apostrophes show that the preceding vowels bear a pitch accent. As Ishihara observes, an accentual fall is observed in each accented word in (34), indicating that (34) consists of three Minor Phrases (MiP):

(35) $(\text{Na'oya-no})_{\text{MiP}}$ $(\text{a'ni-no})_{\text{MiP}}$ $(\text{wa'in-o})_{\text{MiP}}$

That is, anti-labelers correspond to prosodic boundaries. Note that unaccented words show a different pattern:

(36) Naomi-no ane-no wa'in-o
Naomi-GEN big.sister-GEN wine-ACC
'Naomi's big sister's wine ACC' (Ishihara 2015: 572)

Here, only the accented word 'wine' shows an accentual fall. The other two unaccented words form a single Minor Phrase together with the following accented word:

(37) $(\text{Naomi-no ane-no wa'in-o})_{\text{MiP}}$

These observations indicate that an SO with the unlabellable element that is detectable with minimal search is not automatically mapped to some specific phonological domain, and

how it is interpreted is a matter of the phonological component Φ. That is, syntax just provides "usable" information for Φ, and how it is used is totally dependent on Φ.

Saito (2016) further argues that inflectional elements are also anti-labelers in Japanese. Like verbs, adjectives in Japanese exhibit inflection. Then it is expected that prenominal adjectives behave in the same way as genitive-marked DPs, and this is born out:

(38) a. Na'oya-no uma'-i wa'in-o
Naoya-GEN tasty-INFL wine-ACC
'Naoya's tasty wine Acc'

b. Naomi-no ama-i wa'in-o
Naomi-GEN sweet-INFL wine-ACC
'Naomi's big sister's wine ACC'

(38a) and (38b) show exactly the same accentual pattern as (34) and (36), respectively.

In this section, we have seen that Case suffix in Japanese, which is unlabellable but detectable, makes an SO interpretable in Φ, conforming to (8).[14]

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[14] As discussed in Yim and Dobashi (2016), a discourse marker *-yo* in Korean, which adds some politeness to the expression, can be attached ubiquitously and optionally as in the following example:

(i) Ce-A-ka(-yo) ecey(-yo) kkaphey-eyse(-yo) Celin-ul(-yo) mannasse-yo.
Ce-A-NOM(-yo) yesterday(-yo) café-at(-yo) Celin-ACC(-yo) met.C-yo
'Ce-A met Celin at the café yesterday' Yim and Dobashi (2016: 214)

They argue that *-yo* is attached to the right edge of a phonological phrase. They observe that *-yo* attachment is not allowed when its host lacks a Case marker:

(ii) a. Sonnim*(-i)-yo wasse-yo.
guest-NOM-yo came.C-yo
'A guest has come.'

b. Phica*(-lul)-yo sikhyesse-yo.
pizza-ACC-yo ordered.C-yo
'(I) ordered a pizza.' (ibid. 228ff.)

Similarly, certain types of preverbal adverbs cannot host *-yo*, but they can if they accompany a postposition as in (iii.a), or a predication marker *-key* as in (iii.b-c) (see also Yim 2004, 2012):

(iii) a. Kapang-i palo yeki*(-ey)-yo isse-yo.
bag-NOM right here-in-yo exist.C.-yo
'The bag is right here.'

b. Keykho-ka kkoli-lul ppalli(*-yo) wumcikyesse-yo.
gecko-NOM tail-ACC quickly-yo moved.C.-yo
'The gecko moved its tail quickly.'

c. Keykho-ka kkoli-lul ppalu-key-yo wumcikyesse-yo.
gecko-NOM tail-ACC quickly-*key*-yo moved.C.-yo
'The gecko moved its tail quickly.' (ibid. 236ff.)

If these suffixes (Case, postpositions and the predication marker) are all anti-labelers in the sense of Saito (2016), it would be possible to recast Yim and Dobashi's analysis of phonological phrasing in terms of unlabellable suffixal markers that are detectable with minimal search.

Yim and Dobashi (2016: 231ff.) also discuss that a DP lacking a Case marker can host *-yo* when it is interpreted as a topic (the following example is adapted from Yoon 2013):

4.4.2 Unlabellable Conjunction

Chomsky (2013: 45ff.) points out that the "head" of structured coordination does not serve as a label:

(39) $[_{\gamma}$ Z $[_{\alpha}$ Conj $[_{\beta}$ Z W]]]

Here, Z moves out of β to merge with α so that β is labeled W, and γ is labeled Z, indicating that Conj cannot be a label. Given that Conj is unlabellable, α is expected to be unlabeled. If so, the present approach predicts that there can be a prosodic boundary between Z and Conj:

(40) $[_{\gamma}$ Z $[_{\alpha}$ Conj $[_{\beta}$ Z W]]]
↑
A prosodic boundary

Saito (2016: 151 fn.14) notes that a VP coordination in Japanese requires a pause between two conjuncts, which is indicated by a comma below. The conjunction in this case is phonetically empty:

(41) Hanako-wa itumo $[_{VP}$ teeburu-o os-i], $[_{VP}$ kabin-o taos]-u
Hanako-TOP always table-ACC push vase- ACC make.fall-PRES.
'Hanako always pushes the table and makes the vase fall.'

Here, two VPs are coordinated, and a pause is placed between them. The relevant part of the structure is schematically shown below:

(42) $[_{\beta}$ VP $[_{\alpha}$ Conj VP]]
↑
Pause (a prosodic boundary)

Since a pause indicates a prosodic boundary, it would be the case that Conj in Japanese is not a labeller, and that it is detectable with minimal search within the SO α, and therefore α is interpreted as a phonological phrase. It should be noted, however, that a pause is a typical cue to the boundary of Intonational Phrase, which is a larger prosodic constituent that dominates Phonological Phrase in the prosodic hierarchy (see (45) below). I will leave open the question

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(iv) Minswu(-nun)(-yo) onul an wasse-yo.
Minsu(-TOP)(-yo) today not came.C-yo
'Minsu didn't come today.'

This could be accounted for, on the assumptions that a topic phrase with neither a topic marker nor a Case marker stays in Spec-TOP in Korean and that TOP is too weak to serve as a label, creating a prosodic boundary there, just as in the analysis of Italian in (21).

why a pause, which is, in a sense, a "stronger" boundary, is required at α in (42), but it is clear that a prosodic boundary is placed before an SO with the unlabellable but detectable Conj.[15]

If this correlation between Conj and a prosodic boundary is correct, one might wonder why *and* in English does not require a pause or allow some other prosodic-boundary phenomenon:

(43) John and Bill

Notice that if there are three or more conjuncts, we can omit *and* except the last one, and a pause is placed instead:

(44) a. John and Bill and Tom
b. John, Bill(,) and Tom
c. John, Bill, Tom(,) and Greg etc.

This might indicate that *and* is actually a "pause-filler" in that it is prosodically inserted into a pause site so that the overt *and* "masks" the pause, and it sounds as if there is no prosodic boundary there. Another question arises as to why the last or lowest *and* cannot be omitted (except in the case of stylistic asyndeton), to which I do not have an answer now.

Although the discussion in this section is highly speculative, it is important to notice that an SO with the unlabellable but detectable "head" within a conjunction phrase can in fact correspond to a prosodic domain.

5. Remaining Issues

5.1 Other Prosodic Categories

Let us briefly consider the whole architecture of prosodic hierarchy. One of the major flaws of the phase-based theory of phonological phrasing is that it only accounts for phonological phrasing and does not say anything about other prosodic domains in prosodic hierarchy:[16]

[15] α in (39)/(40)/(42) also corresponds to an "intermediate projection" in the sense of traditional X-bar theory. See footnote 9.

[16] Note that in (45) V and Obj form a single phonological phrase together. As discussed in Dobashi (2003), the basic phrasing in English is $\{V\}_{\varphi}\{Obj\}_{\varphi}$, and $\{V\ Obj\}_{\varphi}$ results if $\{Obj\}_{\varphi}$ consists of only one prosodic word. This rephrasing is due to prosodic weight, and it applies for purely prosodic reasons in Φ.

(45) Prosodic Hierarchy (Selkirk 1984, Ito and Mester 2012):

[ ]$_{\iota}$	Intonational Phrase
{ }$_{\varphi}$ { }$_{\varphi}$	Phonological Phrase
( )$_{\omega}$ ( )$_{\omega}$ ( )$_{\omega}$	Prosodic Word
John can eat the cake	

It is not clear why phonological phrases, but not others, are so special that they are demarcated in terms of the only interface operation Spell-Out. Classical theories of prosodic domains such as Nespor and Vogel's (1986) and Selkirk's (1986), and recent theories such as Match Theory (Selkirk 2011) all attempt to provide phrasing mechanisms that account for the entire prosodic structure in (45) in an uniform way, but phase-based theories just ignore the other prosodic categories.

The proposed formulation of syntax-phonology asymmetry, repeated here, has an interesting consequence for the entire picture of prosodic hierarchy:

(6) *Syntax-Phonology Asymmetry (SPA):*

Syntactically inert elements receive interpretation in the processes of externalization Φ.

This notion of syntactic inertness seems to be relevant to the formation of prosodic word and intonational phrase. It is relevant to prosodic word because syntactically inert, or non-functional, elements themselves correspond to prosodic words. So a syntactically inert element forms a basic prosodic word, to which functional elements are incorporated to form a prosodic word. Thus in (45), *eat* and *cake*, which are both content words (i.e., Rs), correspond to basic prosodic words, to which neighboring functional elements, *can* and *the*, are incorporated, forming prosodic words. Note that *can*, which is a realization of T, is assumed to be too weak to serve as a label, but it itself is a functional element so that it does not constitute its own prosodic word. It is "too weak" as far as labeling is concerned.

Syntactic inertness is also relevant to intonational phrasing. Notice that a sentence such as the one in (45) as a whole is not a target of any syntactic operation and does not participate in syntactic derivation. In this sense, it is syntactically inert. I assume that such an entity constitutes an intonational phrase. Other instances of intonational phrases discussed by Nespor and Vogel (1986: 188), such as parentheticals, vocatives, right-dislocated DPs, tag-questions, non-restrictive relative clauses, etc., also seem to be syntactically independent of their "host" sentences. They are related to them in some non-syntactic way,[17] and therefore they are syntactically inert and constitute intonational phrases.

[17] Selkirk (2005: 29) argues that these intonational phrases can be uniformly accounted for in terms of a [+comma] feature, which is semantic, but not syntactic, in nature. See also Dobashi (2013) for a linearization-based approach to the prosodic hierarchy.

In conclusion, SPA in (6) can provide a uniform treatment of the prosodic categories (Prosodic Word, Phonological Phrase, and Intonational Phrase) in the prosodic hierarchy.[18]

5.2 Timing of Phonological Interpretation and Labeling of Unlabeled SOs

Let us consider another remaining issue concerning how unlabeled α and γ are ultimately labeled in (10). The final stage of (10) is repeated here:

(46) $[_C\ C\ [_{<\varphi,\ \varphi>}\ Subj\ [_\gamma\ \ T\ [_\beta\ t_{Subj}\ [_{v^*}\ \ R\text{-}v^*\ [_\alpha\ \ t_R\ \ Obj]]]]]]$

Let us first consider γ. As we have seen in (10), γ is phonologically interpreted when CP phase is reached, given the prosodic cycle formulated in (9). Suppose that internal merge of Subj takes place as an instance of free merge:

(47) a. $[_C\ C\ [_{\gamma'}\ \ \ Subj\ [_\gamma\ \ T\ [_\beta\ t_{Subj}\ \ \ R\text{-}v^*\ \ldots$
b. $[_C\ C\ [_{<\varphi,\ \varphi>}\ \ Subj\ [_T\ \ T\ [_\beta\ t_{Subj}\ \ \ R\text{-}v^*\ \ldots$

In (47a), γ is interpreted as a phonological phrase since it contains unlabellable T detectable with minimal search within γ. In contrast, γ′ is not interpreted as a phonological phrase since it takes a form of {XP, YP} and does not contain a detectable unlabellable element. Therefore γ is the only phonological phrase found in (47a). If labeling of γ applied *before* the phonological interpretation, the phological component could not find any phonological phrase since γ, as well as γ′, would be labeled, as in (47b). So, the phonological interpretation should precede labeling:

(48) An SO with the unlabellable "head" is labeled after phonological interpretation.

Thus, phonological interpretation applies in (47a), and then subsequent labeling takes place as in (47b).

Let us next consider α in (46). Adopting free merge, Chomsky (2015:14) argues that the derivation proceeds (roughly) as follows: (i) Obj undergoes free merge and is internally merged with α, (ii) v* is merged (and perhaps Subj is merged, too), (iii) phasehood is inherited by R, (iv) α′ is labeled <φ, φ>, (v) R raises to v*, forms a R-v* amalgam and activates phasehood on the copy of R, and (vi) the sister of the copy of R is made inaccessible to further computation (Transfer):

(49) a. $[_{\alpha'}\ \ \ Obj\ [_\alpha\ \ R\ \ \ t_{Obj}]]$ --- IM(Obj)
b. [Subj v* $[_{\alpha'}\ \ \ Obj\ [_\alpha\ \ R\ \ \ t_{Obj}]]]]$ --- EM(v*), EM(Subj)

[18] Ito and Mester (2012:296) argue that the prosodic hierarchy consists only of three prosodic categories shown in (45), and that this three-layer hierarchy is universal. As discussed in this section, (6) seems to entail that there are in fact three kinds of syntactically inert elements, which might correspond to the three universal prosodic categories suggested by Ito and Mester.

c. [Subj v* [$_{<\varphi, \varphi>}$ Obj [$_R$ R t_{Obj}]]]] --- Inheritance, Labeling
d. [Subj R-v* [$_{<\varphi, \varphi>}$ Obj [$_R$ t_R t_{Obj}]]]] --- Amalgamation, Transfer(t_{Obj})

If phonological interpretation applied as stated in (48), it would apply at (49b) (i.e., before labeling), where v*P phase is reached. However, there are two problems with this timing of phonological interpretation. First, we would have the wrong word order in which Obj precedes R. Second, R stays in situ at this stage. In order to obtain the desired phonological phrasing, we would expect that R has raised to v* so that R on v* is included in the next phonological phrase that corresponds to γ in (46).

I would like to explore two possible solutions to these problems. A first one is as follows. One notable difference between (46), which we assumed in previous sections, and (49), where free merge raises Obj to Spec-R, is that the latter involves a "very local" internal merge that moves Obj from the complement of R to the specifier of R. This kind of too short movement has often been excluded on empirical basis (see, e.g., Abels 2003, Grohmann 2003, among many others). Abels (2003: 12) proposes the Anti-locality Constraint, which prohibits movement from the complement to the specifer of the same head. Given this, Obj stays in situ (in English and Italian), unlike (49):

(50) [v* [$_\alpha$ R Obj]]

This will solve the word-order problem in (49). Another problem was that R would stay in situ when α is interpreted, given that R raises to v* *after* labeling of α, in Chomsky's (2015) framework. Suppose instead that R raises to v* right after v* is externally merged, because this raising would be required for theta-theoretic reasons, to introduce an external argument.

(51) R raises to v* immediately after v* is externally merged with the SO containing R.

Then, α is labeled as follows:

(52) a. [R-v* [$_\alpha$ t_R Obj]] --- EM(v*), R-raising
b. [Subj R-v* [$_\alpha$ t_R Obj]] --- EM(Subj), Phonological Interpretation
c. [Subj R-v* [$_{<\varphi, \varphi>}$ t_R Obj]] --- Inheritance, Labeling, Amalgamation, Transfer

R raises to v* when v* is externally merged, as in (52a), and Subj is externally merged, as in (52b). At this point, v*P phase is complete (merge-wise), and α is interpreted as a phonological phrase, given the phonological cycle formulated in (9).[19] After this phonological interpretation, phasehood is inherited by the copy of R, and α is labeled <φ, φ>, as in (52c). Here, I assume that R-v* is treated as an amalgam after v* has lost its phasehood.

[19] Although R has moved out of α at this stage, α can be interpreted as a phonological phrase because R can be detected within α at an earlier stage of the same phase level.

Thus in (52c), phasehood is inherited, labeling applies, R-v* becomes an amalgam, phasehood is activated on the copy of R, and Obj is made inaccessible to further computation.

So far, I have outlined an anti-locality solution to the problems with (49). A problem with this solution would be that it is not clear exactly what blocks free merge. So, let us explore another possibility, adopting free merge.

Here again, as stated in (51), I assume that R raises to v* right after v* is externally merged. "Amalgam-hood" of R-v* will result after phasehood of v* is inherited by the copy of R, as discussed above. Then we will have the following derivation, with free merge:

(53)	a.				$[_{\alpha'}$	Obj	$[_{\alpha}$ R	$t_{Obj}]]$	--- IM(Obj)
	b.	[		v*	$[_{\alpha'}$	Obj	$[_{\alpha}$ R	$t_{Obj}]]]$	--- EM(v*)
	c.	[Subj	R-v*		$[_{\alpha'}$	Obj	$[_{\alpha}$ t_R	$t_{Obj}]]]$	--- R-raising, EM(Subj), Phonological Interpretation
	d.	[Subj	R-v*		$[_{<\varphi, \varphi>}$	Obj	$[_{R}$ t_R	$t_{Obj}]]]$	--- Inheritance, Labeling, Amalgamation, Transfer

Obj undergoes free merge and becomes Spec-R, as in (53a); v* is externally merged, as in (53b); R raises to v*, and Subj is introduced, as in (53c), where v*P phase is complete (merge-wise); phasehood is inherited by the copy of R, labeling applies, R-v* acquires "amalgam-hood", phasehood is activated on the copy of R, and t_{Obj} is made inaccessible, as in (53d).

Given (9) and (48), phonological interpretation applies at the stage of (53c), where v*P phase is complete. Note that not only α but also α′ is not labeled yet at this stage. Crucially here, unlike the discussions so far, α is irrelevant to phonological interpretation since it is already devoid of phonetic content, since both R and Obj have moved out of it. In contrast, α′ contains Obj. Notice that α′ can, in principle, be subject to phonological interpretation, for the following reasons: (i) α′ is unlabeled, (ii) Obj is detectable with minimal search since both R and Obj have moved out of α, and α is emptied (cf. (2b), where {XP, YP} is labeled once either XP or YP is emptied), (iii) Obj here should be an unlabellable element, since α′ will be ultimately labeled "<φ, φ>" but not "Obj" or its feature, as in (53d). Then, in (53c), α′ is interpreted as a phonological phrase containing Obj.

In sum, the phonological interpretation of α′ at the stage of (53c) conforms to the proposed (8), repeated here:

(8) An SO with the unlabellable element that is detectable with minimal search is interpreted as a phonological phrase.

SO α′ has an unlabellable Obj, which is detectable with minimal search, and it is interpreted as $\{Obj\}_{\varphi}$. As mentioned above, this analysis departs from our tacit assumption in

the previous sections that Obj stays in situ, but we have reached the same conclusion that Obj forms a phonological phrase alone, without restricting free merge.

I will leave open the choice of these two possible solutions, but in both (47) and (52)/(53), phonological interpretation precedes subsequent labeling. In this way, an SO with the unlabellable element that is detectable with minimal search can be interpreted in Φ, and this SO can be labeled after phonological interpretation.

6. Concluding Remarks

In this paper, I have argued that an SO is interpreted as a phonological phrase if it has an unlabellable element that is detectable with minimal search. That is, an unlabellable but detectable element makes an SO containing it usable in Φ. We have discussed the following SOs that are interpreted as a prosodic domain:

(54) {T, XP}, {R, XP} (or perhaps {Obj, ~~XP~~}), {Case, XP}, {Conj, XP}

Chomsky (2015: 6) states that "the same labeling is required at CI and for the processes of externalization", but the present approach departs from this assumption in that the SOs with an unlabellable but detectable element are interpreted in Φ, and then they are labeled and interpreted at CI. This departure comes from SPA (6), and perhpas it accounts for the systematic discrepancies between syntax and phonology that have motivated some sort of "readjustment" convention or the like since Chomsky and Halle (1968).

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