

## Short Notes on Labelability of T and Externalization

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**ABSTRACT.** In this paper, I claim that the distinction in strength/labelability of T between English-type and Italian-type languages should be reduced to the morphophonological interpretation of the  $\varphi$ -features of T in the processes of externalization. I propose two competing constraints, one that requires that the  $\varphi$ -features be realized in the morphophonological component, and the other that does not, and argue that the interaction of the constraints accounts for the distinction. I show that the proposed approach also accounts for the difference in the morphological realization of T between *be* and perfective *have* in English (suppletion) and lexical verbs in Italian (suffixation).\*

**Keywords:** interface, parameter, labeling algorithm, suppletion

### 1. Introduction

In the analysis of finite clauses in English and Italian that is based on the labeling algorithm (LA), Chomsky (2015) argues that the difference in subject positions in these languages stems from that of labelability of T. Specifically, he argues that English has weak agreement and therefore its finite T is unlabelable, while Italian has strong agreement and so its T is labelable (cf. Rizzi (1982)). The difference in the richness of agreement is exemplified in (1):

- |             |              |              |              |               |                |               |               |
|-------------|--------------|--------------|--------------|---------------|----------------|---------------|---------------|
| (1)         | <i>inf.</i>  | <i>1.sg.</i> | <i>2.sg.</i> | <i>3.sg.</i>  | <i>1.pl.</i>   | <i>2.pl.</i>  | <i>3.pl.</i>  |
| a. English: | <i>love</i>  | <i>love</i>  | <i>love</i>  | <i>love-s</i> | <i>love</i>    | <i>love</i>   | <i>love</i>   |
| b. Italian: | <i>amare</i> | <i>am-o</i>  | <i>am-i</i>  | <i>am-a</i>   | <i>am-iamo</i> | <i>am-ate</i> | <i>am-ano</i> |

The present tense form of the verb *love* in English inflects just for the third person singular, as in (1a). By contrast, the present tense form of the verb *amare* ‘to love’ in Italian shows full inflectional morphology, as in (1b).

In this paper, I reconsider the labelability in terms of the morphophonological interpretation

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of T in the processes of externalization (see Chomsky (2005), *et seq.* for externalization). I argue that the labelability is not lexically given but should be determined derivationally: T becomes labelable if its  $\phi$ -features are valued in syntactic computation. The difference between the languages is attributed to the different interpretive procedure in the morphophonological component. I suggest that there are two competing morphophonological requirements, one that requires that the agreement features be realized in the morphophonological component, and the other that does not. I argue that these requirements are formulated as Optimality Theoretic violable constraints, ranked with respect to each other. The former is ranked higher in Italian so that the valuation of T's  $\phi$ -features is required to apply before the morphophonological interpretation of the derivation; by contrast, the latter is ranked higher in English and the valuation is delayed and applies after the morphophonological interpretation. Furthermore, I show that this approach also accounts for why a suppletive form is chosen for the phonological exponent of finite *be* and *have* in English, and why a regular inflectional suffix is attached to lexical verbs in Italian.

In the current framework of the minimalist program, it is generally assumed that syntax is universal, as stated in (2a). This would entail that syntax does not have a parameter. Then, one of the possible ways to capture the effect of parameter would be to attribute it to externalization as stated in (2b), which is suggested by Berwick and Chomsky (2011) and others.

- (2) a. Syntax is universal.  
 b. Parametric variation is (largely) attributed to the processes of externalization.  
 (Berwick and Chomsky (2011), Tokizaki and Dobashi (2013), cf. Epstein et al. (2017))

If this view is correct, the difference in labelability of T postulated in the syntactic component should be attributed to the properties of externalization. As mentioned above, it is assumed that English T is unlabelable since English has weak agreement while Italian T is labelable since Italian has strong or rich agreement, but it is not clear exactly how the strength or richness of agreement affects the labelability. The distinction may sound like a mere stipulation, and it could be equally possible to assume that weak T is labelable while strong T is not. In what follows, I consider exactly how richness of agreement affects syntax.

## 2. Labeling Algorithm and Strength/Labelability

First, let us briefly review LA (Chomsky 2013, 2015):

- (3) a. H is the label in {H, XP}  
 b. The label of YP is the label of K in (i):

(i)  $\underline{XP} \dots \{_{\underline{K}} \underline{XP}, YP\}$

c. The most prominent feature shared by XP and YP is the label of K in (ii):

(ii)  $\{_{\underline{K}} XP, YP\}$

(3a) states that H is the label in the syntactic object consisting of a lexical item H and a phrase XP since it is the most accessible item in this structure. (3b) illustrates the case where the syntactic object K consists of two phrases XP and YP. In this case, there is no immediate lexical item that can be detected within K. If XP or YP moves out of K, then one of them can be the only visible item in K. If XP moves out of K, as in (3b.i), XP becomes invisible and YP serves as the label of K. Let us next consider (3c), another case of XP-YP structure. If there is a feature shared by XP and YP, that is, if there is an agreement relation between XP and YP, then the shared feature serves as the label of K.

Moreover, if a syntactic object consists of two lexical items, a functional element  $f$  and a lexical element or a root R as in (4), the functional element  $f$  serves as a label since it provides R with a category (see Borer (2005a, b, 2013) and Marantz (1997)). That is, the root R cannot serve as a label, as stated in (5).

(4) In  $\{f, R\}$ ,  $f$  is one of the functional elements determining category. (Chomsky 2013: 47)

(5) R is too “weak” to serve as a label. (Chomsky 2015: 8)

These are the basics of LA. In addition, however, strong/weak distinction is postulated to account for a parametric difference between languages.<sup>1</sup> Specifically, Chomsky (2015: 9) suggests that T is too weak to serve as a label in English while Italian T can be a label because it has rich agreement (see (1)). Given this, let us consider the derivation of an English finite clause, illustrated in (6):

- |     |      |   |               |  |
|-----|------|---|---------------|--|
| (6) | i.   | $[_{\alpha} \text{Subj } v \text{ } [_{VP} \dots ]]$  | $\alpha = ??$ |  |
|     | ii.  | $[_{\beta} \text{ T } [_{\alpha} \text{Subj } v \text{ } [_{VP} \dots ]]]$                          | $\alpha = ??$ | $\beta = ??$   |
|     | iii. | $[_{\gamma} \text{Subj } [_{\beta} \text{ T } [_{\alpha} \text{Subj } v \text{ } [_{VP} \dots ]]]]$ | $\alpha = v$  | $\beta = ??$ $\gamma = \langle \varphi, \varphi \rangle$       |
|     | iv.  | $[_{\gamma} \text{Subj } [_{\beta} \text{ T } [_{\alpha} \text{Subj } v \text{ } [_{VP} \dots ]]]]$ | $\alpha = v$  | $\beta = \text{T}$ $\gamma = \langle \varphi, \varphi \rangle$ |

First, as in (6i), a verbal phrase is created where subject (Subj) is SPEC of  $v$ . It takes the form of XP-YP structure, so the syntactic object  $\alpha$  cannot be labeled at this point. At the second stage (6ii), T is merged with  $\alpha$ , but English T cannot be a label and so it cannot label  $\beta$  at this point. At the third stage (6iii), Subj undergoes internal merge and becomes SPEC of T, and  $\alpha$  is

<sup>1</sup> See Dobashi (2022) for a discussion about strong/weak distinction and its effect on phonological phrasing.

labeled in accordance with (3b), and  $\gamma$  is also labeled because of the feature-sharing (i.e., agreement) between T and Subj. Then, Chomsky (2015: 10) argues that T can label  $\beta$  “after strengthening by SPEC-T.” With Subj being in SPEC of T, T is strengthened, it labels  $\beta$ , and all the syntactic objects are labeled successfully, as in (6iv). I consider this “strengthening” to be a kind of stipulation, and discuss this issue later in this paper.

Let us next consider Italian, whose finite T is strong and labelable:

- (7)
- |        |   |               |  |
|--------|---|---------------|--|
| i.     | $[\alpha \text{ Subj } v \text{ [VP ... ]}]$  | $\alpha = ??$ |  |
| ii.    | $[\beta \text{ T } [\alpha \text{ Subj } v \text{ [VP ... ]}]]$                       | $\alpha = ??$ | $\beta = \text{T}$   |
| iii-a. | $[\gamma \text{ Subj } [\beta \text{ T } [\alpha \text{ Subj } v \text{ [VP ... ]}]]$ | $\alpha = v$  | $\beta = \text{T}$ $\gamma = \langle \varphi, \varphi \rangle$ |
| iii-b. | .... Subj ... $[\beta \text{ T } [\alpha \text{ Subj } v \text{ [VP ... ]}]]$         | $\alpha = v$  | $\beta = \text{T}$   |

The first step (7i) is identical to English. At the second stage (7ii), T is merged with  $\alpha$ , and it labels  $\beta$  since it is strong. Since  $\beta$  has already been labeled, Subj can either move to SPEC of T as in (7iii-a) or undergo topicalization, without becoming SPEC of T, as in (7iii-b). Because of the strength of T, Subj here does not have to be SPEC of T, unlike English. These derivations seem to be supported by the studies of subject positions in Italian, such as Frascarelli (2007).

So far, we have seen how strong/weak distinction works in LA. The labelability of T accounts for the difference in subject positions between English and Italian. The specific questions to consider in this paper are stated in (8):

- (8)
- a. How do we describe the difference in the inflectional morphology between languages?
  - b. How do we account for the effect of morphological difference on syntactic derivation in terms of externalization, without stipulating the strength of T?
  - c. What is “strengthening by SPEC-T”?

In the next section, I attempt to answer these questions from the viewpoint of externalization.

### 3. Proposals

The following are the basic facts to be accounted for:

- (9)
- a. Subject must occupy SPEC-T in English.
  - b. Subject may occupy SPEC-T in Italian.

As we have discussed, these facts have been considered to be related to the strong/weak or

labelable/unlabelable distinction in T. From the viewpoint of morphophonological interpretation of T, two competing requirements seem to be at work: one is to pronounce the  $\phi$ -features of T, as in Italian, and the other is *not* to pronounce the  $\phi$ -features of T, which is basically the case in English:

- (10) a. To pronounce the  $\phi$ -features of T.  
b. Not to pronounce the  $\phi$ -features of T.

Given these competing requirements, it should be the case that one requirement outweighs the other in some languages while the opposite is true in others. This sort of situation is prevalent in the morphophonological component. Thus, Optimality Theory is formulated to allow the interaction of violable constraints, and the ranking among them accounts for cross-linguistic variation (Prince and Smolensky (1993), McCarthy and Prince (1995)). I suggest that the following two competing constraints are operative in the processes of externalization:

- (11) MAX- $\Phi_T$   
A set of the  $\phi$ -features of T has a correspondent in the phonological exponent of T.
- (12) NO- $\Phi_T$   
The  $\phi$ -features of T should be invisible to the morphophonological component.

I consider that (11) is a kind of correspondence constraint of maximality, and that (12) is a kind of markedness constraint. I assume that these constraints are violable, and ranked with respect to each other. I suggest the ranking in (13):

- (13) a. English: NO- $\Phi_T$  >> MAX- $\Phi_T$   
b. Italian: MAX- $\Phi_T$  >> NO- $\Phi_T$

NO- $\Phi_T$  outranks MAX- $\Phi_T$  in English, and MAX- $\Phi_T$  outranks NO- $\Phi_T$  in Italian.

Moreover, I adopt the following assumptions:

- (14) a. Labeling Algorithm (LA)  
b. Free Merge  
c. Free Agree  
d. Unvalued  $\phi$ -features are invisible to the morphophonological component.  
e. Unvalued  $\phi$ -features, once valued, are visible to the morphophonological component.  
f. T is labelable after valuation of the unvalued  $\phi$ -features.

(14a) and (14b) are widely assumed and I adopt them here without further discussion. I assume,

as in (14c), that Agree can apply at any stage of derivation as long as it results in a well-formed structure at the interfaces. (14d) and (14e) concern the visibility of  $\phi$ -features. I assume, as stated in (14d), that unvalued  $\phi$ -features are just invisible to the morphophonological component. That is, they neither have their phonological exponent nor crash the derivation. By contrast, as stated in (14e), unvalued  $\phi$ -features become visible to the morphophonological component once they are valued. Thus, valued  $\phi$ -features in T may have their phonological exponent. Lastly, as in (14f), I assume that T with unvalued  $\phi$ -features are unlabelable, but once its  $\phi$ -features are valued, it becomes labelable. That is, the labelability of T changes depending on whether T has undergone Agree or not.

Given these assumptions, let us first consider English, where NO- $\Phi_T$  outranks MAX- $\Phi_T$ P:

- (15) i.  $[\alpha \text{ Subj } v \text{ [VP ... ]}]$   $\alpha = ??$   
 ii.  $*[\beta \text{ T } [\alpha \text{ Subj } v \text{ [VP ... ]}]]$   $\alpha = ??$   $\beta = T$   
 $\rightarrow$  Agree (T, Subj)  $\rightarrow$  Violation of NO- $\Phi_T$

At the first stage of (15), a verbal phrase is created, and at the second stage, T is merged with the verbal phrase. If Agree applies at this stage, then the  $\phi$ -features of T are valued and become visible to the morphophonological component when spelled-out, and violate the constraint NO- $\Phi_T$ , which is ranked higher, and this violation will be fatal.

Then, it is necessary to delay Agree to save the derivation:

- (16) i.  $[\alpha \text{ Subj } v \text{ [VP ... ]}]$   $\alpha = ??$   
 ii.  $[\beta \text{ T } [\alpha \text{ Subj } v \text{ [VP ... ]}]]$   $\alpha = ??$   $\beta = ??$   
 $\rightarrow$  No Agreement  
 $\rightarrow$  Free Merge  
 iii.  $[\gamma \text{ Subj } [\beta \text{ T } [\alpha \text{ ~~Subj~~ } v \text{ [VP ... ]}]]$   $\alpha = v$   $\beta = ??$   $\gamma = \langle \phi, \phi \rangle$   
 $\rightarrow$  Spell-Out  $\rightarrow$  T is invisible, conforming to NO- $\Phi_T$ .  
 $\rightarrow$  Agree  
 $\rightarrow$  T is now labelable.  
 iv.  $[\gamma \text{ Subj } [\beta \text{ T } [\alpha \text{ ~~Subj~~ } v \text{ [VP ... ]}]]$   $\alpha = v$   $\beta = T$   $\gamma = \langle \phi, \phi \rangle$   
 $\rightarrow$  Labeling by T

At the second stage of (16), T is merged but Agree does not apply. Then, Subj undergoes Free Merge, resulting in the third stage (16iii). If Spell-Out or morphophonological interpretation applies at this point, T's unvalued phi-features are invisible given (14d), and

therefore satisfies  $\text{NO-}\Phi_T$ .<sup>2</sup> At the fourth stage of (16), Agree applies and T becomes labelable, and  $\beta$  is labeled, without recourse to the strengthening operation.

Now, let us consider Italian, where  $\text{MAX-}\Phi_{TP}$  outranks  $\text{NO-}\Phi_T$ .

- (17) i.  $[\alpha \text{ Subj } v \text{ [VP ... ]}]$   $\alpha = ??$   
 ii.  $[\beta \text{ T } [\alpha \text{ Subj } v \text{ [VP ... ]}]]$   $\alpha = ??$   $\beta = \text{T}$   
     → Agree  
     → T is labelable.  
     →  $\varphi$ -features in T are visible to morphophonology.  
 iii-a.  $[\gamma \text{ Subj } [\beta \text{ T } [\alpha \text{ ~~Subj~~ } v \text{ [VP ... ]}]]$   $\alpha = v$   $\beta = \text{T}$   $\gamma = \langle \varphi, \varphi \rangle$   
     → Spell-Out  
 iii-b. .... Subj ...  $[\beta \text{ T } [\alpha \text{ ~~Subj~~ } v \text{ [VP ... ]}]]$   $\alpha = v$   $\beta = \text{T}$   
     → Spell-Out

In the second stage of (17), T is merged and Agree applies. Then, T is labelable given (14f), and the valued  $\varphi$ -features become visible to the morphophonological component under (14e). Then, Subj may undergo Free Merge either to the SPEC of T or to the topic position. When these derivations are spelled out, they can satisfy  $\text{MAX-}\Phi_{TP}$  since the  $\varphi$ -features of T, being visible, can have their correspondent in the morphophonological component.

So far, I have shown how the parametric difference between English and Italian can be accounted for in terms of the morphophonological interpretation of syntactic derivations that is based on the interaction of competing constraints. Note that Italian T is not distinguished from English T in term of the strength in this approach. That is, they are identical and not parameterized.<sup>3</sup>

#### 4. Consequences

In this section, I discuss some consequences of the proposed account of parametric difference. First, we can attribute the effect of strong/weak or labelable/unlabelable distinction to the processes of externalization, following the concept of parameter stated in (2). The labelability is not stipulated but associated with the morphophonological interpretation of the valued  $\varphi$ -features. Second, “strengthening by SPEC-T”, which seems to be specific to English-type languages, can be eliminated. The effect of strengthening can now be captured by the valuation of unvalued  $\varphi$ -features of T, which applies during the derivation not only in English

<sup>2</sup> I put aside the issue as to how the third person singular *-s* in English is treated.

<sup>3</sup> The similar idea was suggested by Andreas Blümel (personal communication). See Blümel (2022: 9) for a related discussion.

but also in Italian. Third, it would be possible to account for why *be* undergoes suppletion in English, as I will discuss in the rest of this section.

In the previous section, I have argued that the derivation of an English finite clause is excluded if T agrees with Subj before Spell-Out since it violates NO- $\Phi_T$ , as illustrated in (15), repeated here in (18):

- (18) i.  $[\alpha \text{ Subj } v \text{ [VP ... ]}]$   $\alpha = ??$   
 ii.  $*[\beta \text{ T } [\alpha \text{ Subj } v \text{ [VP ... ]}]]$   $\alpha = ?? \quad \beta = \text{T}$   
 $\rightarrow \text{Agree (T, Subj)} \rightarrow \text{Violation of NO-}\Phi_T$

However, there seems to be a way to save this derivation in English. Suppose that the clause is progressive or passive and contains *be*, which originates between T and *v* as shown in (19a). If it moves up to adjoin to T as in (19b), then a head-adjunction structure [*be* T] is obtained:

- (19) a.  $[\beta \quad \text{T} \quad [ \quad \mathbf{be} \text{ } [\alpha \text{ Subj } v \text{ [VP ... ]}]]]$   
 b.  $[\beta \text{ } [\mathbf{be} \text{ T}] \quad [ \quad \mathbf{be} \text{ } [\alpha \text{ Subj } v \text{ [VP ... ]}]]]$

Now, the label of this head-head structure should be determined. Both *be* and T in this structure have no internal structure since they are directly drawn from the lexicon, and therefore they are equally accessible in the structure. Notice that one of the two heads cannot move out of the head-head structure (X-Y structure) unlike XP-YP structure in (3b), since excorporation is generally prohibited in the case of head-movement (Roberts (2001)). Then, a possible way to label this structure would be to assume, along the lines with Chomsky's (2015: 12) analysis of the head-head structure [R *v*], that the head adjunction results in an amalgam [*be* T], where neither *be* nor T serves as the label, and instead that the amalgam as a whole becomes labelable and the affix (i.e., T in [*be* T]) becomes invisible for labeling purposes. This indicates that the  $\phi$ -features in T are not T's any more but the amalgam's, so "the  $\phi$ -features of T" in the sense of (12) can no longer be identified, and hence NO- $\Phi_T$  is vacuously satisfied. In addition, the amalgam structure accounts for why *be* undergoes suppletion in English, taking the form of *am/is/are/was/were*, but not, e.g., *\*be-s*. Since [*be* T] is an amalgam where the independent status of T as well as that of *be* is obscure, T alone cannot correspond to its exponent (= a person and number affix), but instead the amalgam as a whole corresponds to its exponent (= a suppletive form). The suppletive form is determined depending on the amalgam's (but not T's)  $\phi$ -features. This approach will also apply to the perfective *have* that adjoins to T to form the



amalgam [*have* T], taking the suppletive form such as *have*, *has*, and *had*.<sup>4</sup>

This approach is consistent with the fact that Italian has a very regular inflectional paradigm as shown in (1), where each inflectional ending can be taken to be an exponent of T. In Italian, a lexical or contentive verb V (technically, [R v]) moves to adjoin to T, resulting in the structure [[R v] T]. Here, T is a simple head with no internal structure while the lexical verb is complex with its internal structure being [R v]. In this case, as Rizzi (2016: 120) suggests, T serves as the label of [[R v] T]. Then, a set of the valued  $\phi$ -features of T becomes visible to the morphophonological component, and it can correspond to its own exponent, satisfying MAX- $\Phi_T$ P. If the whole head-adjunction structure is identified as an amalgam, then “a set of the  $\phi$ -features of T” in the sense of (11) cannot be identified since the  $\phi$ -features are the amalgam’s but not T’s, and hence MAX- $\Phi_T$ P cannot be satisfied. Therefore, T alone has its own exponent, taking the form of an inflectional suffix such as *-o* and *-i*.

In this section, I have argued that the proposed attempt to reduce the strong/weak distinction to the processes of morphophonological interpretation of the  $\phi$ -features of T can account for the fact that *be* and perfective *have* in English take a suppletive form while Italian lexical verbs do not.

#### 4. Conclusion

In this paper, I tried to attribute the effect of syntactic strong/weak distinction to the processes of externalization. Obviously, there remain many questions to be answered, but I hope to show in my future study that the reduction of the stipulative parameter to externalization has significant empirical consequences including the account of suppletion and suffixation discussed in this paper.

I summarize the paper by answering the questions listed in (8), repeated here:

- (8)
- a. How do we describe the difference in the inflectional morphology between languages?
  - b. How do we account for the effect of morphological difference on syntactic derivation in terms of externalization, without stipulating the strength of T?
  - c. What is “strengthening by SPEC-T”?

(8a): the difference is described in terms of the proposed constraints that interact with each other. (8b): the constraint interaction makes the difference in the timing of valuation of  $\phi$ -

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<sup>4</sup> The same goes for *do* inserted by *do*-support, except that it does not originate between T and v.

features, and this difference in turn is reflected in the morphophonological realization of the  $\phi$ -features. (8c): strengthening is not specific to English-type languages, but it can be recast as the change in the labelability of T triggered by the valuation of  $\phi$ -features, which applies both in English and in Italian. In addition to these, I tried to show that the present approach can account for the difference in morphological realization of T between *be* and perfective *have* in English (suppletion) and lexical verbs in Italian (suffixation).

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