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PREPOSITIONS AND NULL DETERMINERS*

1 INTRODUCTION

Although there have been plenty of discussions on Case assignment in generative grammar, Case assignment of prepositions and related issues are still unclear. In English, for instance, the phonetically null relative, represented as *Op* in (1), cannot appear in the complement position of prepositions, as illustrated in (1c).

(1) a. the man to whom I spoke
b. the man who(m) I spoke to
c. *the man to Op I spoke
d. the man Op I spoke to

In addition, the preposition *on* is not required in active sentences by the verb *insist*, which selects a *that*-clause as its complement, as in (2a, b), but it is required in passive sentences, as in (2c, d).

(2) a. *John insisted on that you be here on time. (Inada 1981: 127)
b. John insisted that you be here on time. (Rosenbaum 1967: 83)
c. That you be here on time was insisted on by John. (ibid.)
d. *That you be here on time was insisted by John. (ibid.)

In this brief article, I will show that both phenomena can be accounted for by clarifying the properties of prepositions and phonetically null determiners.

2 DERIVATION OF RELATIVE CLAUSES

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Donati and Cecchetto (2011) propose a HEAD-raising analysis and claim that *wh*-relative clauses like (3a) are derived from the structure in (3b).

(3) a. the book which John saw
b. [$_{DP}$ the [$_{NP}$ [$_{N}$ book] [$_{CP}$ [$_{DP}$ which ~~book~~] John saw ~~which book~~]]]

As for *that*-relative clauses, they suggest that relative clauses like (4a) are derived from (4b).

(4) a. the book that John saw
b. [$_{DP}$ the [$_{NP}$ [$_{N}$ book] [$_{CP}$ that John saw [$_{DP}$ D ~~book~~]]]]

Donati and Cecchetto propose that every lexical item can transmit its label when it is merged with another category. "Merge" here refers to both internal Merge and external Merge, which indicates that a lexical item has the power to relabel the structure with which it merges. Based on this analysis, they claim that the antecedent *book*, which is N, is base-generated within the relative clause and headed by the determiners in both (3) and (4). They also postulate a null determiner, as shown in (4b), and the determiners that merge with *book* are the relative *which* and the null determiner D in (3) and (4), respectively. In (3b), the DP *which book* moves as a whole to SPEC-CP, and then only the N *book* moves out of the DP and merges with the CP, whereby the N relabels the whole set as NP. This explains why the relative *which* always appears at the head of relative clauses when it occurs. On the other hand, in (4b) *book* is raised directly from the base-generated position, i.e., the complement position of the null determiner D, and merges with the relative clause CP, which is also relabeled as NP.

Their analysis elegantly explains the fact that the relative clause "head" seems to play a double role in the overall structure; it is not only a constituent of the matrix clause but also satisfies the selectional requirements of the predicate within the relative clause. In short, the gap in a relative clause corresponds to the trace of the antecedent.

According to Radford (2016), however, Donati and Cecchetto's analysis has at least two crucial problems. One is that a singular count noun like *man* never appears with a null determiner in clauses that are not relative clauses, as in (5).

(5) They have arrested [$_{D}$ the / *Ø] man. (Radford 2016: 417)

A second problem is that if their analysis of *that*-relatives is correct, we must assume the long-distance movement operation in (6), which violates the Phase-Impenetrability Condition (PIC, Chomsky (2000)).

(6) a. the man that they say that they have arrested
b. [$_{DP}$ [$_{D}$ the] [$_{NP}$ [$_{N}$ man] [$_{CP}$ [$_{C}$ that] they say [$_{CP}$ [$_{C}$ that] they have

arrested D ~~man~~]]]] (ibid.)

To solve these problems, Radford argues that (4a) is derived from the structure (7), which is essentially identical to the structure of *wh*-relatives in (3b) except that a null operator, which is D, selects *book*.[1]

(7) [$_{DP}$ the [$_{NP}$ [$_{N}$ book] [$_{CP}$ [$_{DP}$ [$_{D}$ Op] ~~book~~] that John saw ~~[$_{D}$ Op] book~~]]]

As the null operator *Op* has a *wh*-feature, the DP [Op book] undergoes *wh*-movement to the edge of the relative clause. Accordingly, (6a) is considered to be derived from a structure like (8).

(8) [the [man [[Op ~~man~~][that they say [~~[Op man]~~ [that they have arrested ~~[Op man]~~]]]]]]

As a result, no violation of PIC is induced in the derivation of (6a).

Although neither Donati and Cecchetto (2011) nor Radford (2016) proposes a structure for relative clauses like (9), I assume that the syntax of (9) and of *that*-relatives are essentially the same except that the former has a null complementizer *Ø* in place of the overt complementizer *that*, as illustrated in (10).

(9) the book John saw
(10) [$_{DP}$ the [$_{NP}$ [$_{N}$ book] [$_{CP}$ [$_{DP}$ [$_{D}$ Op] ~~book~~] Ø John saw ~~[$_{D}$ Op] book~~]]]

Based on this assumption, I will account for the difference in grammaticality between (1c) and (1d) in the next section.

3 LABELING OF NULL DETERMINERS

3.1. Labeling Algorithm

Merge is an operation that combines two elements α and β into {α, β}. Chomsky (2013) argues that this operation must accompany an algorithm that specifies the nature of the formed object. Thus, the set {α, β} must be labeled in some way. Under the labeling algorithm (LA) that Chomsky (2013) proposes, if α is a head and β is not, then LA selects α as the label of the form {α, β}. If neither α nor β is a head,

[1] Although Radford (2016) further assumes that antecedents of relative clauses are not Ns but NPs, I do not adopt this proposal for expository purposes, as the difference is irrelevant to the discussion here.

there are two ways to label the form {α, β}, one of which is to raise either α or β out of {α, β}. Suppose the case where α is raised out of the form {α, β}. There is then only one visible head, and β is selected as the label. The other way is possible if α and β are identical in a relevant respect, thereby providing the same label, and in this case the label that is the most prominent feature shared by α and β can be taken as the label of the formed object. Suppose the case where α is a T and β is the subject of the sentence. Since the φ-features on the T and the subject agree, they share prominent features, i.e., the φ-features, and thus the φ-features can be taken as the label of the form {α, β} in this case.

3.2. Weak Heads

Chomsky (2015) further suggests that only a strong head can provide the label for the formed object {H, XP} where H is a head, and that T is a weak head in English. In addition, he assumes that feature sharing makes a weak head strong and enables it to provide the label. This is why SPEC-TP must always be filled in English, while languages like Italian, which shows rich agreement, lack EPP. In English, raising subject to SPEC-TP enables the formed object {Subj, {T, …}} to be labeled by the shared φ-features. On the other hand, T can label without raising the subject to SPEC-TP in Italian since T is strong in that language.

3.3. Proposal

Based on Chomsky's (2013, 2015) LA, I assume (11)–(13) in this article to explain the grammaticality of (1):

(11) Null Ds are weak and cannot provide labels *per se*.
(12) Null Ds lack Case features.
(13) P(reposition)s bear "interpretable" Case features.

Assuming (11), let us see how the set {DP, {T, …}}, where D is null, is labeled. First, consider the following structure:

(14) $[_{CP}\ C\ [_{\alpha}\ T_{[u\varphi]}\ [\ldots\ [_{\beta}\ DP_{[i\varphi]/[uCase]}] \ldots$

In (14), T inherits the uninterpretable φ-features from C, which then agree with the interpretable φ-features on D. Through this agreement, the φ-features on T are valued by those on D. As assumed in (11), β cannot be labeled because the null D cannot provide any label. The same is true of labeling α because T is also weak in

English. However, internal Merge of the DP at SPEC-TP, as in (15), resolves these labeling problems.

(15) $[_{CP}\ C\ [_{\gamma}\ [_{\beta}\ DP_{[i\varphi]/[uCase]}]_i\ [_{\alpha}\ T_{[v\varphi]}\ [\ldots\ t_i\ \ldots$

Now that the φ-features on D and T are shared, D and T become strong and can provide labels. Accordingly, α, β, and γ in (15) are labeled TP, DP, and <φ, φ>, respectively.

Next, let us consider agreement between P and D. It is recognized that only "uninterpretable" Case features exist in syntax, and that the uninterpretable Case features of DPs are valued nominative and accusative through φ-feature agreement with C-T and *v**-V, respectively. This means that Case features do not appear on T or V *per se*. Actually, neither T nor V reflects its Case in appearance. In contrast, it is also well known that prepositions can substitute for Case markers in English, as in (16)–(17).

(16) a. John's friend
b. the friend of John

(17) a. John gave Mary a piano.
b. John gave a piano to Mary.

Not only the suffix *-'s* but also the preposition *of* represent genitive Case in (16). Additionally, the preposition *to* represents dative Case in (17b), and thus (17a) and (17b) show almost the same construal. Considering these facts, I assume that prepositions are the sole category that bears an "interpretable" Case feature. Moreover, we find languages in which prepositions (or postpositions) assign Case to DPs, but it is unlikely that we find languages in which prepositions show φ-feature agreement with DPs. In any case, English is not such a language. If we assume that Case assignment is triggered by agreement, we need to clarify what features are involved when P assigns Case to the complement DP. Thus, I propose that the "interpretable" Case feature on P agrees with the uninterpretable Case feature on D, which is valued oblique by P.

Now let us discuss the derivation of (1a), which is repeated as (18a).

(18) a. the man to whom I spoke
b. the man who(m) I spoke to
c. *the man to Op I spoke
d. the man Op I spoke to (= (1))

In (18a), the P *to* and the D *whom* agree, and *whom* is assigned oblique Case. This is verified by the fact that *who*, which is nominative or accusative form, cannot be substituted for *whom* in (18a) in the usual cases, as illustrated in (19).

(19) *the man to who I spoke

On the other hand, I suggest that *who* or *whom* in (18b) agrees with the *v**-V complex *spoke* in the relative clause based on the fact that either *who* or *whom* can be merged where accusative Case is assigned.[2]

A question that arises now is why (18c) is not acceptable. According to the analysis proposed in Section 2, (18c) has the following structure:

(20) [$_{DP}$ the [$_{NP}$ [$_{N}$ man] [$_{CP}$ [$_{PP}$ [$_{P}$ to] [$_{\alpha}$ [$_{D}$ Op] ~~man~~]] [$_{C}$ Ø] I spoke ~~to Op man~~]]]

Since the D *Op* in the relative clause is null, α cannot be labeled. According to (12), *Op* also lacks Case feature and thus cannot be labeled by Case feature sharing with the P *to*, leaving α unlabeled, hence the unacceptability of (18c).

One might wonder why (18d) is acceptable if the above analysis is correct. (18d) is considered to be derived from the structure shown in (21).

(21) [$_{DP}$ the [$_{NP}$ [$_{N}$ man] [$_{CP}$ [$_{\alpha}$ [$_{D}$ Op] ~~man~~] [$_{C}$ Ø] I spoke to ~~Op man~~]]]

Op in (21) is also null and unable to provide the label, but α is directly merged with the relative clause CP, which the null C *Ø* heads. If *Op* is essentially identical to overt *wh*-relatives except that it is unpronounced, it is natural to postulate that *Op* is endowed with a *wh*-feature and the feature agrees with *Ø*. Therefore, *Op* becomes strong and it can provide the label by *wh*-feature sharing with *Ø*, hence the acceptability of (18d).

4 THE STRUCTURE OF *THAT*-CLAUSES

The analysis of null determiners above also accounts for the grammaticality of (2), repeated here as (22).

(22) a. *John insisted on that you be here on time.
b. John insisted that you be here on time.
c. That you be here on time was insisted on by John.
d. *That you be here on time was insisted by John. (= (2))

In this article, I assume that the verb *insist* selects either PP or CP as its complement. *That*-clauses are considered to be CPs, which then naturally explains the

[2] One might wonder what the φ-features on the *v**-V complex *spoke* agree with in (18a). According to Fujita and Matsumoto (2005), unergative verbs can take unpronounced cognate objects. I assume that *spoke* in (18a) agrees with its unpronounced cognate object.

grammaticality of (22b), where the *that*-clause is CP. On the other hand, P selects DP, but it is not considered to select CP; hence, the ungrammaticality of (22a).

Why then is it not (22d) but (22c) that is grammatical? To solve this puzzle, we can use the simple notion that what agrees with the matrix T is always DP. Before analyzing the derivation of (22c), let us discuss the sentential subject construction, as in (23b).

(23) a. It is likely that John loves Mary.
b. That John loves Mary is likely.
c. The story is likely. (Inada 1989: 42)

As we see in (23c), the predicate *likely* takes a DP as argument, which leads us to assume that the *that*-clause in (23b) is a DP. This contradicts the analysis above. However, it is not necessary to choose CP or DP for the category of *that*-clauses. *That*-clauses can be either CP or DP, and I propose that CP *that*-clauses and DP *that*-clauses have the structures in (24a) and (24b), respectively.

(24) a. $[_{CP}\ [_{C}$ that] …
b. $[_{\alpha}$ D $[_{CP}\ [_{C}$ that] …

The sole difference between (24a) and (24b) is that in the latter structure, the null D takes the CP *that*-clause as its complement. As we have assumed, the null D is weak and unable to provide the label in (24b) without feature sharing. Based on this analysis, I suggest that (23b) is derived as shown in (25a, b):

(25) a. $[_{CP}$ C $[_{\beta}$ T-is likely $[_{\alpha}$ D $[_{CP}$ that John loves Mary]]]]
b. $[_{CP}$ C $[_{<\varphi,\ \varphi>}\ [_{DP}$ D $[_{CP}$ that John loves Mary]] $[_{TP}$ T-is likely ~~$[_{DP}$ D $[_{CP}$ that John loves Mary]]~~]]]]

In (25a), the T to which the verb *is* is raised and the D are weak as they are, but agreement between the two heads and raising α to SPEC-TP make them strong and enable them to provide the labels.

One might wonder how sentences like (23a) are derived if the analysis here is on the right track. Stroik (1996) claims that the expletive *it* is base-generated at SPEC-CP, as demonstrated in (26).

(26) a. I just knew it that Mary would fire John today.
b. *I just knew it where Mary would fire John today. (Stroik 1996: 239)

According to Stroik, in (26b), the *wh*-element *where* cannot move to SPEC-CP in the embedded clause because the position is occupied by the expletive *it*; hence the deviance of (26b). Following Stroik's analysis, I propose that (23a) is derived from

(27).

(27) [$_{CP}$ C [$_{\beta}$ T-is likely [$_{\alpha}$ D [$_{CP}$ [$_{DP}$ it$_{[uCase]}$] [that John loves Mary]]]]]

If α in (27) is raised to SPEC-TP in the same way as in (25b), both α and β are labeled as shown in (28).

(28) [$_{CP}$ C [$_{<\varphi, \varphi>}$ [$_{DP}$ D [$_{CP}$ [$_{DP}$ it$_{[uCase]}$] [that John loves Mary]]] [$_{TP}$ T-is likely ~~[$_{DP}$ D [$_{CP}$ [$_{DP}$ it$_{[uCase]}$] [that John loves Mary]]]~~]]]

However, this derivation poses one problem: the uninterpretable Case feature on the expletive *it* is not valued. The null D is closer to the matrix T than *it* in (27), which prevents agreement between the T and *it*. This analysis is supported by the fact that (28) yields the ungrammatical sentence (29).

(29) *It that John loves Mary is likely.

To resolve this problem, let us assume that the null D optionally bears uninterpretable φ-features that agree with those on the expletive *it*, and that the feature sharing that makes the null D strong is triggered by internal Merge of *it* with the D, as in (30).[3]

(30) [$_{CP}$ C [$_{\beta}$ T-is likely [$_{\gamma}$ [$_{DP}$ it$_{[uCase]}$] [$_{DP}$ D [$_{CP}$ ~~[$_{DP}$ it$_{[uCase]}$]~~ [that John loves Mary]]]]]]

Note that the expletive *it* is accessible to the matrix T in (30). Moreover, β and γ can be labeled TP and DP, respectively, if *it* is raised to SPEC-TP, which correctly predicts the grammaticality of (23a).

Now we are ready to explain the derivation of (22c). If P only selects DP, (22c) is derived as shown in (31).

(31) a. [$_{CP}$ C [$_{\beta}$ T-was insisted [$_{PP}$ on [$_{\alpha}$ D [$_{CP}$ that you be here on time]]]]]
b. [$_{CP}$ C [$_{<\varphi, \varphi>}$ [$_{DP}$ D [$_{CP}$ that you be here on time]] [$_{TP}$ T-was insisted [$_{PP}$ on ~~[$_{\alpha}$ D [$_{CP}$ that you be here on time]]~~]]]]

The φ-features on the matrix T agree with those on the null D in (31a). Then, α and β are labeled by feature sharing between the matrix T and the null D after internal Merge of α to SPEC-TP.

One might then wonder why (22a) is deviant if the *that*-clause can be DP, which can be selected by P. To answer this question, let us suppose that the *that*-clause is

[3] I will give a more detailed discussion of the uninterpretable φ-features on D in the next section.

DP in (22a). In such a case, the structure for (22a) is as follows:

(32) [$_{CP}$ C [$_{<\varphi, \varphi>}$ John [$_{TP}$ T ~~John~~ insisted [$_{PP}$ on [$_{\alpha}$ D [$_{CP}$ that you be here on time]]]]]]

As shown in (32), α is merged with the P, which only bears the interpretable Case feature, and thus it cannot be labeled by feature sharing because the null D bears no Case feature. This is why (22a) is unacceptable regardless of the category of the *that*-clause. In addition, as pointed out in Honda (2012), some of my informants judged that (33) sounds a little awkward and redundant but is still acceptable.

(33) ?John insisted on it that you be here on time. (Honda 2012: 139)

If the abovementioned analysis is on the right track, (33) is derived from a structure like (34).

(34) [$_{CP}$ C [$_{TP}$ John insisted [$_{PP}$ on$_{[OBL]}$ [$_{\alpha}$ [$_{DP}$ it$_{[uCase]}$] [$_{DP}$ D [$_{CP}$ ~~[$_{DP}$ it$_{[uCase]}$]~~ [that you be here on time]]]]]]]

Although the uninterpretable Case feature on the expletive *it* is valued oblique by the preposition *on*, α cannot be labeled because it is of the form {DP, DP}, where one of the DPs needs to be raised for labeling. I assume that this is why most of my informants judged (33) as awkward. On the other hand, for those who accept (33), I assume that prepositional phrases may be derived as shown in (35), which is reminiscent of the derivation of *v**P.

(35) a. [$_{pP}$ *p* [$_{PP}$ P DP$_{[uCase]}$]]
b. [$_{pP}$ *p*-P [$_{PP}$ DP$_{[OBL]}$ [$_{P'}$ ~~P~~ ~~DP$_{[uCase]}$~~]]]

If the prepositional phrase in (33) has the layered structure in (35), the expletive *it* is raised out of α, as in (36).[4]

(36) a. [$_{CP}$ C [$_{TP}$ John insisted [$_{pP}$ *p* [$_{PP}$ on [$_{\alpha}$ [$_{DP}$ it] [$_{DP}$ D [$_{CP}$ ~~[$_{DP}$ it]~~ [that you be here on time]]]]]]]
b. [$_{CP}$ C [$_{TP}$ John insisted [$_{pP}$ *p*-on [$_{\beta}$ [$_{DP}$ it] [$_{P'}$ ~~on~~ [$_{\alpha}$ ~~[$_{DP}$ it]~~ [$_{DP}$ D [$_{CP}$ ~~[$_{DP}$ it]~~ [that you be here on time]]]]]]]

In (36), α is labeled DP due to raising of *it*, and β is labeled by the Case feature shared by the P and *it*. Thus, (33) is acceptable in this case.

[4] To be precise, the embedded CP cannot be labeled unless the expletive *it* is raised because it is of the form {DP, CP}.

Finally, let us consider why (22d) is not acceptable. As we have assumed above, the verb *insist* selects either PP or CP, which indicates that the *that*-clause in (22d) is CP. If CP does not bear features that can agree with T, we can conclude that (22d) is deviant because α in (37) cannot be labeled regardless of the raising of the *that*-clause to the matrix SPEC-TP.

(37) a. [$_{CP}$ C [$_{\alpha}$ T-was insisted [$_{CP}$ that you be here on time]]]
b. [$_{CP}$ C [$_{\alpha}$ [$_{CP}$ that you be here on time] [$_{TP}$ T-was insisted ~~[$_{CP}$ that you be here on time]~~]]]

Additionally, if the expletive *it* is merged at SPEC-CP of the embedded clause as in (38a), internal Merge of *it* to the matrix T labels α as <φ, φ> in (38).

(38) a. [$_{CP}$ C [$_{\alpha}$ T-was insisted [$_{CP}$ [$_{DP}$ it] [that you be here on time]]]]
b. [$_{CP}$ C [$_{<\varphi, \varphi>}$ [$_{DP}$ it] T-was insisted [$_{CP}$ ~~[$_{DP}$ it]~~ [that you be here on time]]]]

This explains why sentences like (39) are not entirely unacceptable to some of my informants.

(39) ?It was insisted that you be here on time.

Interestingly, sentences like (40) are also not completely unacceptable, and (40) is considered to be derived as shown in (41) based on the analysis here.[5]

(40) ?It was insisted on that you be here on time.

(41) a. [$_{CP}$ C [$_{\beta}$ T-was insisted [$_{PP}$ on [$_{\alpha}$ [$_{DP}$ it] [$_{DP}$ D [$_{CP}$ ~~[$_{DP}$ it]~~ [that you be here on time]]]]]]]
b. [$_{CP}$ C [$_{<\varphi, \varphi>}$ [$_{DP}$ it] T-was insisted [$_{PP}$ on [$_{DP}$ ~~[$_{DP}$ it]~~ [$_{DP}$ D [$_{CP}$ ~~[$_{DP}$ it]~~ [that you be here on time]]]]]]]

5 OTHER NULL DETERMINERS

I have proposed that the null operator *Op* and the null D that selects CP are weak and unable to provide labels. However, I argue that other determiners that select ordinary noun phrases can provide the labels whether they are weak or strong. This

[5] I am not sure why different speakers have made different judgements on (33), (39) and (40). Some of my informants judged all three sentences as marginal. I leave this issue for future research.

suggestion is based on the fact that we observe agreement between determiners and noun phrases in languages like French, as in (42).

(42) a. le métro
the.MASC.SG subway.MASC.SG
'the subway'
b. les métros
the.PL subways.MASC.PL
'the subways'
c. la gare
the.FEM.SG station.FEM.SG
'the station'

I assume that D bears uninterpretable φ-features, and that these features can agree with the interpretable φ-features on *n*P, which corresponds to the main body of a noun phrase excluding its article, e.g., *métro*, *métros*, and *gare* in (42), if the D selects the *n*P as its complement. Accordingly, bare plural nouns like *girls* are of the form {D, girls}, where D is null, and the φ-features on the D and the *n*P *girls* agree, labeling the form <φ, φ>. Therefore, unlike (22a), there is no labeling problem in PPs like (43).

(43) John talked [$_{PP}$ to girls].

However, there is another possibility to explain the labeling of the DP *girls* in (43). In French, a plural count noun as well as a singular count noun appears with an overt determiner, as shown in (44).

(44) a. un ami
INDEFINITE.MASC.SG friend.MASC.SG
'a friend'
b. des amis
INDEFINITE.PL friends.MASC.PL
'friends'

This seems to indicate that bare plural nouns are bare "by chance" in English, i.e., no corresponding overt indefinite article happens to exist in English. I assume that the null determiner in (43) is different from one that takes a *that*-clause by nature, and that only the latter can select CP as its complement.

Furthermore, although it is not clear why the null *Op* cannot bear uninterpretable φ-features while the null D can, the reason may be that uninterpretable φ-features on *Op* would prevent a relative head, which bears φ-features, from moving out of the set {Op, *n*P}. I leave this problem open here and simply assume that *Op* never appears with φ-features.

6 Conclusion

In this paper, I have explained why unpronounced relatives cannot follow Ps by assuming, following the analyses of Donati and Cecchetto (2011) and Radford (2016), that the null relative *Op* is a null determiner. I propose that null determiners are weak heads like English T and lack Case features, and that P bears the interpretable Case feature. This proposal makes it possible to predict where the null relative *Op* can appear under Chomsky's (2013, 2015) LA.

In addition, I have shown that null determiners can head *that*-clauses, and that the analysis of null determiners can account for sentences that show no one-to-one pair of active and passive as in (22).

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