

# Where a Null C Fails to PF-merge

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**Sungshim Hong. 2005. Where a Null C Fails to PF-merge.** *Language and Information 9.2*, 69–83. This paper discusses the distribution of a null complementizer C, as opposed to an overt counterpart ‘that’, presenting empirical support both for and against the PF-merge analysis of C proposed by Boscovic and Lasnik (2003, henceafter B&L) who in turn attribute to the proposal in Pesetsky (1992) and Halle & Marantz (1993). In Section I, as a background, I discuss B&L’s proposal that a null complementizer C is a PF-affix which undergoes a PF-merger operation at the PF component. In Section 2, after a brief sketch of the distribution of a null C mostly in *bare*-relatives, I explore the possibility of extending B&L’s analysis to accommodate the null C’s in the *bare*-relative constructions. In Section 3, I argue that despite some empirical difficulties, B&L’s analysis of a null C as a PF-affix can still be maintained, if Adverb Fronting is an operation to Spec-C position. Furthermore, I propose a rule — PF Spell-Out Constraint — to account for the C-trace (i.e. *that*-trace) effect in relative constructions. With the PF Spell-Out Constraint and B&L’s PF-merge account, the distribution of a null C can better be analyzed. (Chungnam National University)

**Key words:** Adjacency, Adverb Fronting, bare-relative constructions, a null complementizer, PF merger, Edge, C-trace effect, extraposition, stacking

## 1. Introduction

B&L’ (2003) propose a PF-merger account of a null complementizer, C, based on the distribution of null complementizer C’s. They have studied the following examples and point out that the alternation between an overt complementizer ‘that’ and a null C can be best captured if a null C is a PF affix that undergoes an operation called PF-merger at the PF component. In other words, this PF-merger operation can be instantiated through the affix-hopping approach. Let us consider the following examples that show the distributional difference between an overt C, ‘that’,<sup>1</sup> and a null C.

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<sup>1</sup> In a paper in process (Hong, 2005), I have discussed the categorial status of ‘that’, specifically whether ‘that’ in so called *that*-relatives is a relative pronoun or a complementizer which in-

- (1) a. \*It seemed at that time [ C [David had left]].  
 b. \*What the students believe is [ C [they will pass the exam]].  
 c. \*They suspected and we believed [ C [Peter would visit the hospital]].  
 d. \*Mary believed Peter finished school and Bill [ C [Peter got a job]].  
 e. \*[ C [John likes Mary]] Jane didn't believe.
- (2) a. It seemed at that time [ that [David had left]].  
 b. What the students believe is [ that [they will pass the exam]].  
 c. They suspected and we believed [ that [Peter would visit the hospital]].  
 d. Mary believed Peter finished school and Bill [ that [Peter got a job]].  
 e. [ That [John likes Mary]] Jane didn't believe.

B&L's insight is that there is no need to appeal to the concept of government to account for the alternation between an overt C and a null C. Specifically speaking, the ungrammatical examples in (1) show that a null C cannot be merged with its verbal head due to the intervention of some lexical elements between a null C and its head, V.<sup>2</sup>

Being a PF affix, a null C needs to be adjacent to its lexical head. In the cases above, the relevant head is the element with [+V]. Therefore, 'seemed' in (1a), 'believe' in (1b), 'suspected' and 'believed' in (1c), 'believed' and 'finished' in (1d), and finally 'believe' in (1e) are the heads with which a null C PF-merges. The intervening lexical elements between the null C and its head are the causes of the ungrammaticality of the examples in (1). These examples, of course, improve with the overt C, 'that,' as shown in (2). Therefore, a PF affix, C searches for an adjacent host with the relevant syntactic feature. Furthermore, the following examples with which Pesetsky (1992) finds empirical difficulty are straightforwardly accounted for under the PF merger analysis of B&L's.

- (3) a. I heard about the proof [ that [Mary did it]].  
 b. \*I heard about the proof [ C [Mary did it]].
- (4) a. I heard about the fact [ that [Mary did it]].  
 b. \*I heard about the fact [ C [Mary did it]].

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introduces a relative clause. See Hong for feature specifications of Complementizer types, but in this paper, it is assumed that 'that' is a C (complementizer) rather than a relative pronoun.

<sup>2</sup> B&L extend their analysis to a noun head which licenses a null C. This will soon be discussed later in this paper, but in these cases, the hosting head is obviously a verb.

The examples in (3) and (4) are the instances of the content clause, also known as a complement clause. A null C is not allowed in this environment, and B&L's analysis correctly accounts for the ungrammaticality of (3b) and (4b) since the null C, a PF affix, is not adjacent to a [+V] element 'heard'. The ungrammatical examples in (3b) – (4b) undermine Pesetsky's analysis since he has to assume that the null C cannot undergo the affixation onto a word like 'proof' or 'fact'.

Note that although B&L have treated all instances of null C's uniformly, it should be obvious that null C's can further be divided into two types: one is a null C that attaches to a [+V] host which will search for a verbal or an adjectival lexical head as its host, and the other is a null C that attaches to a [+N] host which will account for relative constructions. The null C in (3) – (4) is not adjacent to its verbal head, 'heard', which constitutes the ungrammaticality.

What happens in grammatical cases such as (3a) and (4a)? They are equipped with an overt complementizer, 'that', and the overt C is not a PF-affix and needs not to undergo PF affix hopping.

B&L also discuss bare-relative clauses. If the licenser of a null C must be some kind of [+V] element, a relative construction can be problematic since the head of a relative construction is a noun or [-V] element. But, extending their account, we can say that a relative clause contains a (relative) C which undergoes PF-merger with [+N] head. Consider the following examples:

- (5) a. The child C Alexis was waiting for was lost.  
 b. The child that Alexis was waiting for was lost.
- (6) a. The child was lost that Alexis was waiting for.  
 b. \*The child was lost C Alexis was waiting for.

(5a) is a case with a null C and (5b) is a case with an overt C in *that*-relative construction. As they show, a null C and overt C can alternate in (5), where a null C in (5a) is licensed by its head noun. In a relative construction, a head noun serves as a host for the PF affix, C. However, (6a) and (6b), in which the relative clause is extraposed, do not show such a paradigm. A null C is not licensed when extraposed as (6b) illustrates. B&L's explanation is given below:

- (7) a. The child [ RO C [Alexis was waiting for t]] was lost<sup>3</sup>  
 b. The child [ RO that [Alexis was waiting for t]] was lost
- (8) a. The child was lost [ RO that [Alexis was waiting for t]]  
 b. \*The child was lost [ RO C [Alexis was waiting for t]]

Therefore, on one assumption, B&L's account of the null C in relative constructions works well and therefore can be maintained. The host to which the null

<sup>3</sup> In this paper, RO stands for relative operator, OP stands for Operator, and both are interchangeably used in this paper.

C attaches can be of a lexical category with [+V] for a declarative C, and with [+N] for a relative C. In sum, B&L's account correctly distinguish the grammatical contrast between (6a) and (6b).

We have shown how B&L's account of null C affixation to a lexical head works, as either a nominal head for relative clauses or a verbal head for indicative/complement clauses. The schematic representation of the cases in question is given below for clarity of exposition:

(9) ...lexical head ... $\beta$ ... [<sub>CP</sub>  $\alpha$  [+WH] [<sub>C'</sub> C [ ..... ]]] ....

When  $\alpha$  in (9) is RO with [+WH] feature, it seems that RO does not block C-affixation to its lexical head. When  $\beta$  is a lexically overt element, then an affix C cannot attach to the lexical head; otherwise, it would constitute a violation of adjacency. Given that much, we extend B&L's analysis to more constructions with null C's.

## 2. Extending PF-merger Analysis

### 2.1 Empirical support for B&L's analysis

In this section, it is shown that some of the cases are well accommodated by B&L's account, and some others cause empirical difficulty for B&L.

First, other than the ones with extraposed clauses given above, B&L have not provided an account of so-called bare-relative constructions. Consider the following from McCawley (1998, p. 433):

(10) Stacking of Relative Constructions

- a. The book that I bought that Ann had recommended was boring.
- b. The book I bought that Ann had recommended was boring.
- c. \*The book that I bought Ann had recommended was boring.

The examples in (10) are cases where the relative clauses are "stacked". When this stacking takes place, McCawley notes that (10a) and (10b) are grammatical combinations, whereas (10c) is not. Why is this grammatical contrast possible? If we extend B&L's analysis to these cases, (10b), as opposed to (10c), has the following structure.

(11) The book [<sub>CP</sub> RO C [I bought [that [Ann had recommended]]]] ....

If C in (11) is an affix, it needs a phonetically full host since an affix by definition needs to attach to an overt host. The RO in Spec-C is not overt and cannot accommodate the affix C.<sup>4</sup> The adjacent host is the head noun, 'the book',

<sup>4</sup> The remaining question is whether the intervening RO blocks the adjacency requirement or not. Assume that RO contains at least one feature, [+WH], among many others such as [+EPP] which requires its Spec to be filled according to Chomsky (2001). Then, C's attachment to its head, 'book', is intervened by RO with [+WH]. If any phonetic operation like *wanna* contraction or Auxiliary Reduction (Radford, 1988, 1997a, 1997b) is to be accounted for, based on the existence of a null constituent like Wh-trace, then the PF-merger operation or PF-cliticization of C onto the head noun is untenable because of the null relative operator, RO.

and in spite of the RO with [+WH], we can argue that C PF-merges with its head noun, ‘the book’. (10c) is easy to explain; the relevant structure with the operator and the complementizer C is given below:

(10) \*The book [RO that I bought [RO C [Ann had recommended]]] was boring.

Since the offending null C needs its host ‘the book’ nearby, (10c) constitutes a case of adjacency violation, as B&L might have argued.

A second set of data comes from various authors like Culicover (1976), Harris & Vincent (1980, henceforth H&V), and Weisler (1980).

- (11) a. John looked up the information that Mary had requested.  
 b. John looked up the information  $\emptyset$  Mary had requested.  
 c. John looked the information up that Mary had requested.  
 d. \*John looked the information up  $\emptyset$  Mary had requested.

Examples in (11) contain phrasal verbs, and if we assume that the particle ‘up’ and the lexical verb ‘look’ undergo a kind of “reanalysis”, then we can explain the ungrammaticality of (11d) as opposed to (11b). In (11d), the null C illustrated here as  $\emptyset$  is not adjacent to its nominal head ‘information’.

Therefore, the ungrammaticality of (11d) is borne out if we follow B&L’s account. So far, we have seen that B&L’s account of the distribution of null complementizer C seems to work well even in the cases we have presented.

A third set of data that would be well accommodated by B&L’s proposal is the following from Weisler (1980, p. 626)

- (12) a. John gave a book that he wrote to Mary  
 b. John gave a book to Mary that he wrote
- (13) a. John gave a book C he wrote to Mary  
 b. \*John gave a book to Mary C he wrote

Again, the ungrammatical case involves a null C which is separated from its head, ‘a book’, and therefore, (13b) is a case of adjacency violation.<sup>5</sup>

## 2.2 Problematic cases for PF-affix approach

In what follows, I present some data that will cause empirical difficulty for B&L. The first set of examples for testing B&L’s approach comes from Weisler (1980, pp. 629–631). They are conjoined relative clauses with an overt complementizer ‘that’ and a null C. A clause headed by an overt C and that by a null C should be coordinated if they are of the identical category type.

<sup>5</sup> We interpret B&L’s “adjacency” to be a linear adjacency, now that they have not given any accurate definition of the term.

## (14) Coordinate Structures

- a. The book that John read and that Bill wrote is boring.
- b. ?The book C John read and that Bill wrote is boring.

## (15) a. A moose that Mary shot and that Sue stuffed is in the corner.

- b. ?A moose C Mary shot and that Sue stuffed is in the corner.

If B&L's analysis is correct, then (14b) and (15b) are expected to be fully grammatical, since the adjacency condition is not violated in either examples. The affix C is adjacent to its nominal heads, 'book' and 'moose' respectively. Nonetheless, the examples have been reported to be only marginal, which is peculiar.

The second problematic case comes from H&V (1980, p. 805).

(16) a. I discovered the criteria  $\emptyset$  I had evidently not been meeting.

- b. I discovered the criteria  $\emptyset$  I evidently had not been meeting.

- c. \*I discovered the criteria  $\emptyset$  evidently I had not been meeting.

- d. I discovered the criteria that evidently I had not been meeting.

H&V note that, in English, zero relatives<sup>6</sup> and Adverb fronting cannot take place simultaneously.<sup>7</sup> In other words, English tolerates either a zero relative (i.e. with a null C) or an Adverb Fronting in a relative clause but not both. They have not provided a principled explanation about this.

Now, the question is how we can explain the ungrammaticality of (16c), if we adopt B&L's approach. There is a null C adjacent to its nominal head, 'criteria,' in this bare-relative construction. The null C, a PF affix, is predicted to merge with the host, yet the result is the ungrammatical (16c).

Thirdly, some cases with passive sentences cause empirical difficulties for B&L as well. Consider the following from Quirk *et.al.* (1985, pp. 1248–1249)

## (17) a. They are delighted with the person who/that has been appointed.

- b. \*They are delighted with the person  $\emptyset$  has been appointed.

<sup>6</sup> In this paper, for the sake of consistency, we have been using *bare-relatives*, rather than zero-relatives. The name for this kind of construction varies and should not confuse readers. For example, Weisler (1980) calls this *That-less relatives*.

<sup>7</sup> An anonymous reviewer points out that not only Adverb fronting constructions but also other constructions such as Topicalization and Locative Inversion are disallowed in the same context. Depending on the syntactic nature of Topicalization and its Operator, we somehow need to differentiate Relative Operator from Topic Operator. In *Passing, Topicalization*, too, shows the *that*-trace effect as the following examples from Lasnik & Saito (1992, pp. 82–83) illustrate:

- (i) \*John, I think that t won the race
- (ii) that race, I think (that) John won

We will leave the *that*-trace effect in Topicalization constructions open for further research.

- (18) a. They are delighted with the book which/that has just appeared.  
 b. \*They are delighted with the book  $\emptyset$  has just appeared.

(17a) and (18a), as opposed to (17b) and (18b), are grammatical. A null C in (17b) and (18) is adjacent to its head noun 'person' without any intervening element, and therefore, it is expected to PF-merge, but it does not seem to behave that way, which constitutes a problematic case for B&L.

Fourth, again from Weisler (1980, p. 630), the following grammatical examples have been reported.

- (19) a. I read the book about John C Max wrote.  
 b. I read the book by Chomsky C you recommended.  
 c. I signed the letter to the newspaper C you left in my box.

The examples above include a null C, and furthermore, it is not adjacent to its head.<sup>8</sup> We, then, wrongly predict the sentences to be ungrammatical, but they are reported to be fully grammatical.

The final set of counter-examples for PF-merger analysis is where a null C is hosted by an adjective as in Adjectival constructions. As a matter of fact, B&L discuss the following example and suggest their idea to handle the examples of that nature in footnote 20.

- (20) a. I'm afraid he left (Stowell, 1981, p. 412)  
 b. I'm afraid [ C [ he left ]]

If (20) is judged to be grammatical, as in Stowell, then B&L's account of the C-affixation can be easily extended to a [+V] element on the assumption that adjectives are specified as [+V, +N]. However, their account cannot explain the following examples where we find the judgement split (Radford, 2004b, pp. 125–126).

- (21) a. It is clear that he was framed.  
 b. It is clear he was framed.
- (22) a. It is undeniable that he was framed.  
 b. ?\*It is undeniable he was framed.  
 c. ?\*It is undeniable [ C [he was framed]]
- (23) a. It is clear to everyone that he was framed.

<sup>8</sup> Weisler (1980), for that reason, argues for a different sentential structure for a *bare*-relative construction. Namely, it is S (or equivalently TP) rather than S' (an equivalent of CP). He therefore differentiates *bare*-relatives from other relatives.

- b. ??It is clear to everyone he was framed.  
 c. \*??It is clear to everyone [ C [he was framed]]

Assuming the correctness of the judgement given above, it is not clear how B&L can account for the ungrammaticality or the marginal status of (22b). If they allow (21b), following the logic they adopt for (20), then (22b) would remain unaccounted for. If they disallow (22b), then (21b) is a wrinkle in their theory. Note, in passing, that (23b) is relatively easy to explain: the null C is apart from its [+V] head, 'clear'. To summarize, we have presented a list of counter-examples for a simple PF-account similar to B&L's.

### 3. Toward a Solution

In the discussions above, I have presented the distributional and syntactic properties of a null complementizer C, showing that B&L's account of the distribution of null C is illuminating and can be easily extended to cover more data than they have actually analyzed. Furthermore, there are some problematic cases which render empirical difficulties to PF-merger analysis of a null C. In what follows, I propose a solution to accommodate some of, but not all of, the empirical difficulties pointed out in 2.2.

The first set of counter-examples to consider involve the Adverb Fronting cases. As a violation of the Filter of Chomsky & Lasnik (1977), H&V (1980, p. 805) observe the following oddity repeated from (16) for the ease of the reader.

- (24) a. I discovered the criteria  $\emptyset$  I had evidently not been meeting.  
 b. I discovered the criteria  $\emptyset$  I evidently had not been meeting.  
 c. \*I discovered the criteria  $\emptyset$  evidently I had not been meeting.  
 d. I discovered the criteria that evidently I had not been meeting.

As H&V point out, English tolerates either a zero relative (i.e. with a null C) or an Adverb Fronting in a relative clause but not both. However, it is a descriptive generalization and their description does not render any principled reason why (24c) is not grammatical.

I argue that B&L's PF-affixation analysis can be maintained if we propose Adverb Fronting to be an operation that fronts an AdvP to Spec-C position. Therefore, the correct representation of (24c) is not (25) but (26) below:

- (25) I discovered the criteria [<sub>CP</sub> RO C [<sub>TP</sub> evidently [<sub>TP</sub> I had not been meeting]]]  
 (26) I discovered the criteria [<sub>CP</sub> evidently<sub>j</sub> [<sub>CP</sub> RO C [<sub>TP</sub> t<sub>j</sub> I had not been meeting]]]

The mysterious ungrammatical status of (24c) is no longer problematic for a PF-merger analysis of a null C; the null C is not adjacent to its lexical head. The



remaining concern is whether we can find any supporting evidence for such an operation. We know that a TP adverb like ‘evidently’ starts out from inside the embedded TP, and then it is fronted to Spec-C position. If the adverb does not undergo Adverb Fronting, then the relevant example is (24d). In passing, in a root clause, the following example is worth our attention.

(27) Evidently, John had not been studying syntax hard.

Therefore, the representation of (27) is the following with respect to its meaning:

- (28) a.  $[_{CP} \text{ Evidently}_j [_{TP} t_j [_{TP} \text{ I had not been studying syntax hard } ]]]$   
 b. It is evident that John had not been studying syntax hard

If this line of reasoning is on the right track, we should be able to find more supporting data of this nature, and indeed we can in the following from Lasnik (1999, p. 157):

- (29) a. I visited a man who John mentioned.  
 b. I visited a man that John mentioned.  
 c. I visited a man  $\emptyset$  John mentioned.
- (30) a. I visited a man recently who John mentioned.  
 b. I visited a man recently that John mentioned.  
 c. ?\*I visited a man recently  $\emptyset$  John mentioned.

Lasnik (1999) points out that when a relative clause is extraposed, there is a rather sharp contrast between (29c) and (30c). Following B&L’s PF-affix analysis of a null C, we can correctly account for the fact that (30c) is ungrammatical; the correct representation of (30c) is below:<sup>9</sup>

- (31)  $...[_{VP} [_{VP} [_{VP} \text{ visited } [_{DP} \text{ a man } [_{CP} t_k ]]]] \text{ recently}] [_{CP_k} \text{ RO}_i \text{ C } [_{TP} \text{ John mentioned } t_i ]]]$

The adverb ‘recently’ is an adjunct to a maximal projection VP in this example, and it blocks the PF affixation of the null C in (31) above. Therefore, sentence (30) is correctly ruled out.

Another set of examples from H&V is given below:

- (32) a. I saw a photograph of a church I had never visited when I was in Rome.

<sup>9</sup> To exhaust the logical possibilities, what H&V should have included in their argument is the following example:

(i) I saw a photograph of a church when I was in Rome that I had never visited.

The above example (i) means “*When I was in Rome, I saw a photograph of a church that I had never visited.*”

- b. I saw a photograph of a church that when I was in Rome I had never visited.
- c. \*I saw a photograph of a church when I was in Rome I had never visited.

The representations of (32b) and (32c) are the following respectively:

- (33) a. .... L H [<sub>CP</sub> RO<sub>i</sub> that [<sub>TP</sub> when I was in Rome [<sub>TP</sub> I had never visited t<sub>i</sub> ]]]
- b. .... L H [<sub>CP</sub> [when I was in Rome]<sub>j</sub> [<sub>CP</sub> RO<sub>i</sub> C [<sub>TP</sub> t<sub>j</sub> [<sub>TP</sub> I had never visited t<sub>i</sub> ]]]]]

Only (33a) but not (33b) is allowed since in (33b) C a PF affix is not adjacent to its lexical head. Therefore, once we have allowed the adverb fronting to the Spec-C position, the distribution of a null C is nicely accounted for by the B&L's analysis.

For the final piece of evidence, though indirect, we take the following example to be highly suggestive:

- (34) John<sub>1</sub> wonders [<sub>CP</sub> [which picture of himself<sub>1/2</sub> ]<sub>i</sub> [<sub>TP</sub> Bill<sub>2</sub> bought t<sub>i</sub> ]]

The fact that 'himself' in the Spec-C position can be coreferential with the matrix subject 'John' explicitly indicates that the Spec-C position must be available for any interpretive Binding effect.<sup>10</sup> Therefore, we take that the fronted adverb is in Spec-C position, which can cause the blocking of PF-affixation, yielding the ungrammaticality.

The second set of problematic examples to consider includes the marginal status of the coordinate structures given in (14)–(15), repeated below as (35).

- (35) a. ?The book C John read and that Bill wrote is boring.
- b. ?A moose C Mary shot and that Sue stuffed is in the corner.

We speculate that the marginal status of the above examples may have something to do with a kind of phonological constraint that resists the coordination of a phonetically overt category and its null counterpart of the null C; Weisler (1980) suggests that this problem is more or less of processing nature rather than grammatical nature.

For B&L's approach to gain greater empirical advantage, the following ungrammatical examples from the discussions in 2.2 have to be accounted for:

- (36) a. \*They are delighted with the person C has been appointed.
- b. \*They are delighted with the book C has just appeared.

The representation of (36a), for example, is the following:

<sup>10</sup> Chomky (2000, 2004) calls the Spec-C position Edge, and Edge in XP is accessible for a grammatical/syntactic operation in the next phase.





#### 4. Remaining Problems and Conclusion

We have discussed some of the empirical problems in which a null C fails to PF-merge, and proposed a solution for B&L's empirical difficulties.

Yet, there are still remaining examples that deserve our attention and further research. These include the coordinate structures between a null C and an overt C.

- (44) a. ?The book C John read and that Bill wrote is boring.  
 b. ?A moose C Mary shot and that Sue stuffed is in the corner.

The RO is a null operator in the complement position, and a null C should be able to attract to its Spec position. However, the example is reported to be marginal.

Another issue that has to be addressed is the lexical idiosyncrasy of the examples discussed in Radford (2004b, pp. 125–126)

- (45) a. It is clear that he was framed.  
 b. It is clear he was framed.  
 (46) a. It is undeniable that he was framed.  
 b. \*??It is undeniable he was framed.

The examples above include a null indicative C, and nothing else. There is no null/overt operator. B&L's account alone cannot explain the ungrammatical status of (46b), nor can our proposal of PF Spell-Out Constraint, either. We suggest that it has something to do with the lexical antonym of the adjective in the example. It is not a matter of a null C. Rather, it is a matter of the lexical property of the adjective involved, since the above examples in (45) and (46) are syntactically identical.

To conclude, we have discussed the PF-affixation account of a null C proposed by B&L and presented empirical difficulties that they face. Therefore, in Section 3, we have proposed a solution to salvage B&L's account; namely, Adverb Fronting is to Spec-C (Edge of CP) and a constraint, specifically PF Spell-Out Constraint, for the disparity we find in Wh-interrogatives and relatives with respect to the C-trace effect in relative constructions.

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