Complementizers at the Syntax-Phonology Interface*

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Abstract

This paper investigates the distribution of complementizers in English. An (2007) proposes a generalization that a null complementizer must be banned at the edge of an intonational phrase. Though his generalization looks elegant at first sight, it faces a serious problem of why a null complementizer can be contained in a root clause. The purpose of this paper is to solve the problem by proposing a cyclic application of the Strong Start constraint to intonational phrases which are upgraded to utterance if the constraint is satisfied. This system naturally deduces the (un-)availability of both overt/covert complementizers.

***Keywords*:** complementizers, intonational phrase, utterance, Strong Start, Multiple Spell-Out

1. Introduction

In English, there are two types of complementizers (Cs) available for declarative clauses, *that* and Ø, as exemplified in (1).

(1) a. I believe [$_{CP}$ that John liked linguistics].
b. I believe [$_{CP}$ Ø John liked linguistics]. (An (2007: 39))

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As shown in (1), the overt C *that* has a null counterpart Ø. However, this alternation cannot take place freely; in some syntactic positions, the null C cannot be used. For instance, it cannot be used as a head of an extraposed clause:

(2) a. I believe very strongly [$_{CP}$ that [$_{IP}$ John liked linguistics]].
b. *I believe very strongly [$_{CP}$ Ø [$_{IP}$ John liked linguistics]].
(An (2007: 39))

Many suggestions, especially in the realm of syntax, have been made to capture the distribution of Cs in English, such as Stowell's (1981) Empty Category Principle-based account, Doherty's (1997) reduced clause analysis, and a null C affix approach, which has its origin in Pesetsky (1995), proposed by Bošković and Lasnik (2003) (see also Bošković (2005)).

In contrast to these approaches, An (2007) pays particular attention to a prosodic constituent, Intonational Phrase (IntP), which is the domain of intonation. On the basis of the observation that clauses in noncanonical positions (i.e. noncomplement positions of verbs) must be parsed as separate IntPs and that null Cs are banned at the edge of the relevant clauses, he proposes a generalization that a null C at the edge of an IntP must be banned. Though his generalization looks simple and elegant, his approach faces a serious problem in the case of a null C contained in a root clause, as pointed out by Lohndal and Samuels (2013). To solve this problem, I will propose an alternative analysis that explains the distribution of overt/covert Cs by a cyclic application of a prosodic constraint, Strong Start, to IntPs. To be precise, I will suggest that this prosodic constraint should be imposed on every IntP constituted by CP at the timing when it undergoes Spell-Out, and that only if the constraint is satisfied may the relevant IntP be upgraded to an utterance. This cyclic application of Strong Start allows us to predict the (un-)availability of both overt/covert Cs. In addition, I will argue that a clause at a noncanonical position

constitutes an IntP because it undergoes early Spell-Out proposed by Uriagereka (1999).

This paper is organized as follows. In section 2, I will briefly review the previous studies, Bošković and Lasnik (2003) and An (2007). Specifically, An proposes the Null C Generalization involving the distribution of null Cs in clauses at noncanonical positions. With regard to the generalization, I will point out its substantial problems concerning a root clause. In section 3, I will deduce the (un-)availability of both overt/covert Cs from the mapping procedure from syntax to phonology. Section 4 concludes the paper.

2. Previous Analyses: Bošković and Lasnik (2003) and An (2007)

2.1 Bošković and Lasnik (2003)

Bošković and Lasnik (2003) are the first to tackle the distribution of Cs in English from both syntax and phonology to my best knowledge. Their main argument is that (i) null Cs are PF-affixes as distinct lexical items requiring specific hosts, (ii) the null C affixes attach to their hosts by PF Merger, and (iii) the null C affixes need to be adjacent to their hosts at PF. As a consequence of the combination of (i)-(iii), the (un-)availability of the null C in the following example can be explained:

(3) a. It seemed [$_{CP}$ C [$_{IP}$ David had left]].
b. * It seemed at the time [$_{CP}$ C [$_{IP}$ David had left]].

(Bošković and Lasnik (2003: 529))

(3a) shows that the null C affix is adjacent to its host verb *seemed* and thus it can be phonologically realized via PF Merger to the host verb, while in (3b), the null C is not adjacent to its host verb *seemed* due to the intervention of the adjunct *at the time* between them and therefore the null C affix cannot attach to the host verb, failing to

be phonologically realized. Note that the null C affix attached to the host verb needs a specific host designated as [+V], so the adjacent adjunct cannot be a proper host. In this way, the syntactic categories are crucial for Bošković and Lasnik's analysis. Although I will not go into details, they further develop their arguments by assuming different types of null Cs: for null relative pronouns, Bošković and Lasnik assume that they require [+N] elements for its host. Additionally, they make a distinction between null Cs with/without an EPP feature in order to account for the (un-)availability of null Cs when extraction takes place from a relevant clause containing them.

Though their analysis is appealing, assuming several types of null Cs as distinct lexical items, depending on the hosts that they require in terms of syntactic categories and the presence/absence of an EPP feature, is conceptually problematic. As An (2007) points out, this assumption is not plausible when we consider that children need to learn those phonologically empty elements as distinct lexical items; the different types of null Cs increase the burden for learners.

2.2. An (2007)

An (2007) examines null Cs contained in clauses not adjacent to verbs by which they are selected, which are referred to as "noncanonical" clauses (versus canonical clauses), including an extraposed clause (4), a clausal subject (5), a topicalized clause (6), a clausal complement of NP (7), an RNRed clause (8), and a clause right after a gapped element (9):

(4) a I believe very strongly [$_{CP}$ that [$_{IP}$ John liked linguistics]].
b. *I believe very strongly [$_{CP}$ Ø [$_{IP}$ John liked linguistics]].
(5) a. [$_{CP}$ That [$_{IP}$ the teacher was lying]] was hardly obvious.
b. *[$_{CP}$ Ø [$_{IP}$ the teacher was lying]] was hardly obvious.

(Stowell (1981: 396))

(6) a. [$_{CP}$ That [$_{IP}$ the teacher was lying]], Ben already knew.
b. *[$_{CP}$ Ø [$_{IP}$ the teacher was lying]], Ben already knew.
(Stowell (1981: 397))

(7) a. I distrust [$_{NP}$ the claim [$_{CP}$ that [$_{IP}$ Bill had left the party]]].
b. *I distrust [$_{NP}$ the claim [$_{CP}$ Ø [$_{IP}$ Bill had left the party]]].
(Stowell (1981: 398))

(8) a. They suspected and we believed [$_{CP}$ that [$_{IP}$ Peter would visit the hospital]].
b. *They suspected and we believed [$_{CP}$ Ø [$_{IP}$ Peter would visit the hospital]]. (Bošković and Lasnik (2003: 529))

(9) a. Mary believed that Peter finished school and Bill [$_{CP}$ that [$_{IP}$ Peter got a job]].
b. *Mary believed that Peter finished school and Bill [$_{CP}$ Ø [$_{IP}$ Peter got a job]]. (ibid.)

On the grounds of the phonological data provided in previous studies such as Bošković (2001, 2005), Bošković and Lasnik (2003), Nespor and Vogel (1986), Richards (1999), Schütze (1994) and Selkirk (1978), An observes that each of these clauses in the constructions must be parsed as a separate IntP, which is the domain of intonation, or the second largest constituent in the prosodic hierarchy proposed by Selkirk (1984):[1]

(10) [... ... ...] Utterance
[... ... ...][... ... ...] I-Phrase
[...][... ...][... ... ...][... ...] Prosodic Word
[...][...][...][...][... ...][...][...] Foot, Syllable
(An (2007: 50))

Since the clauses at noncanonical positions, which ban the occurrence of null Cs, must be parsed as separate IntPs, he moves on to suggest the following generalization on null Cs in relation to IntP:

(11) Null C Generalization (An (2007: 58))
If a clause is obligatorily parsed as a separate I-phrase (i.e., if a clause appears in a noncanonical position), it cannot be headed by a null C.

Given that the clauses in the noncanonical positions must be parsed as separate IntPs, the generalization (11) rules out the null Cs in the examples from (4b) to (9b), repeated here as (12a) to (12f), respectively:

(12) a. I believe very strongly (*Ø John liked linguistics)ι
b. (*Ø the teacher was lying)ι was hardly obvious
c. (*Ø the teacher was lying)ι, Ben already knew
d. I distrust the claim (*Ø Bill had left the party)ι
e. They suspected and we believed (*Ø Peter would visit the hospital)ι
f. Mary believed that Peter finished school and Bill (*Ø Peter got a job)ι

Furthermore, his generalization correctly rules in the occurrence of a null C in a clause at a canonical position (the complement position of a verb):

(13) a. I believe [$_{CP}$ Ø John liked linguistics].
b. (I believe Ø John liked linguistics)ι

According to An, the embedded clause at the canonical position is not necessarily parsed as a separate IntP as shown in (13b), and thus the null C is not at the edge of

IntP, not violating the generalization (11). In this way, the generalization correctly predicts the grammatical use of both *that* and Ø in a clause at the canonical position as well.

The question is why we cannot have a null C at the edge of an IntP. He attributes the unavailability of a null C at the edge of an IntP to a mismatch between the edges of two different phonological constituents in the prosodic hierarchy, making a set of assumptions in (14):

(14) a. I-phrasing must occur at the juncture between two prosodic words.
b. I-phrases are isomorphic with syntactic constituents that are obligatorily parsed as I-phrases.
c. Prosodic words can be informally defined as phonologically independent words that bear stress. (An (2007: 60))

(15) *I saw the child yesterday [$_{CP}$ Ø Ø [$_{IP}$ John likes]].
↑ ↑
obligatory I-phrase boundary prosodic word boundary (ibid.)

Simply put, (14b) requires that the edges of an IntP coincide with the edges of CP. Thus, the left boundary of IntP in (15) is at the edge of CP.[2] On the other hand, according to (14c), the boundary of Prosodic Word (PrW) in (15) is made within IP: the prosodically empty null C cannot bear stress, whereas *John* inside IP can bear stress. Therefore, the left boundary of the IntP, which is at the edge of CP, cannot coincide with that of the PrW, which is within IP, as illustrated in (15). Thus, the representation in (15) gives rise to a violation of (14a), which requires that the boundaries of IntPs should coincide with those of PrWs.

Though his generalization looks simple and elegant at first sight, a root clause poses a substantial problem for his analysis:

(16) a. [$_{CP}$ Ø John likes linguistics].

b. (Ø John likes linguistics)ι

Given that a null C is present in a root clause, the Null C Generalization predicts that (16a), which is perfectly grammatical, should be ruled out, because the null C is at the edge of the IntP, as illustrated in (16b). To circumvent this problem, following Chomsky (1995), An assumes that there is no CP present in narrow syntax; C is inserted at LF and thus the Null C Generalization correctly rules in a root clause consisting of IP in narrow syntax in his assumption.

However, as Lohndal and Samuels (2013) criticize, this analysis does not hold any longer when we consider Chomsky's later work, Chomsky (2008), in which phi-features on T need to be inherited from C so that C must be present in a root clause in narrow syntax.

Additionally, Lohndal and Samuels mention that such insertion of C at LF violates the Inclusiveness Condition in Chomsky (1995), which prohibits features absent in numeration from being added at LF and PF:

(17) The Inclusiveness Condition (Chomsky (1995: 209))

"A "perfect language" should meet the condition of inclusiveness: any structure formed by the computation (in particular, π and λ) is constituted of elements already present in the lexical items selected for N; no new objects are added in the course of computation apart from rearrangements of lexical properties..."

The Inclusiveness Condition may not be problematic to An's analysis under the assumption that C is already in the numeration before the insertion at LF. However, such kind of insertion of C at LF is not allowed in the current Y-model in the Minimalist framework, in which a syntactic object is transferred to PF and LF at

some point in a syntactic derivation. Thus, his assumption that C is inserted at LF, to circumvent the problem of the occurrence of a null C in a root clause, is problematic in these two respects.

Finally, let me point out a theoretical problem concerning the formation of IntP. An stipulates that CP at a noncanonical position must be parsed as an IntP, while CP in a canonical position can be parsed as an IntP. This kind of distinction cannot be made by simply stating that CP is isomorphic with an IntP. Thus, An's analysis is just a descriptive generalization based on the empirical data and cannot predict when CP constitutes an IntP. In this respect, we need a system in which we are able to see if CP constitutes an IntP by referring to a syntactic derivation.

In this section, I have reviewed and pointed out some problems with Bošković and Lasnik (2003) and An (2007), both of which focus on the distribution of null Cs. In the next section, I will provide an alternative analysis, paying attention to overt C *that* rather than covert C.

3. Proposal and Analysis

3.1 Assumptions and Proposal

3.1.1 The Distribution of *that* and Ø

Let me first scrutinize the distribution of Cs in English. An (2007), as shown in the previous section, points out that null Cs are banned at the edge of IntP. However, this way of generalizing the distribution of null Cs is problematic in that it cannot capture the availability of a null C in a root clause as mentioned above. By contrast, when we take a closer look at the distribution of an overt counterpart *that*, it shows an interesting pattern:

(18) a. *[$_{CP}$ That he can't stand garlic]. (Radford (2018:105))
b. (That he can't stand garlic)ι

As illustrated in the example, *that* cannot be used in a root clause and An does not pay attention to this fact, because he centers his analysis on null Cs in noncanonical positions, regarding a root clause as an exception. However, there is good reason to take the distribution of *that* into account. Let me provide the whole distribution of both overt and covert Cs in a prosodic hierarchy which contains just utterance and IntP:

(19) a. [ ]ʊ
[^{ok}Ø]ɪ [*Ø]ɪ
b. [ ]ʊ
[*that]ɪ [^{ok}that]ɪ
c. [ ]ʊ
[^{ok}Ø/^{ok}that]ɪ [ ]ɪ

An's generalization covers the null C occurring at the edge of the IntP which does not coincide with the left edge of the utterance in the prosodic hierarchy, as in (19a). However, the generalization cannot correctly predict the occurrence of the null C in a root clause, that is, at the edge of the utterance in the prosodic hierarchy in (19a). In contrast, the only position in which *that* cannot be used is the utterance-initial position as described in (19b, c), which may lead to a simpler generalization. Therefore, I will base my analysis on the distribution of *that*, rather than that of Ø, to capture the entire distribution of the Cs in English

3.1.2 Assumptions and Proposal

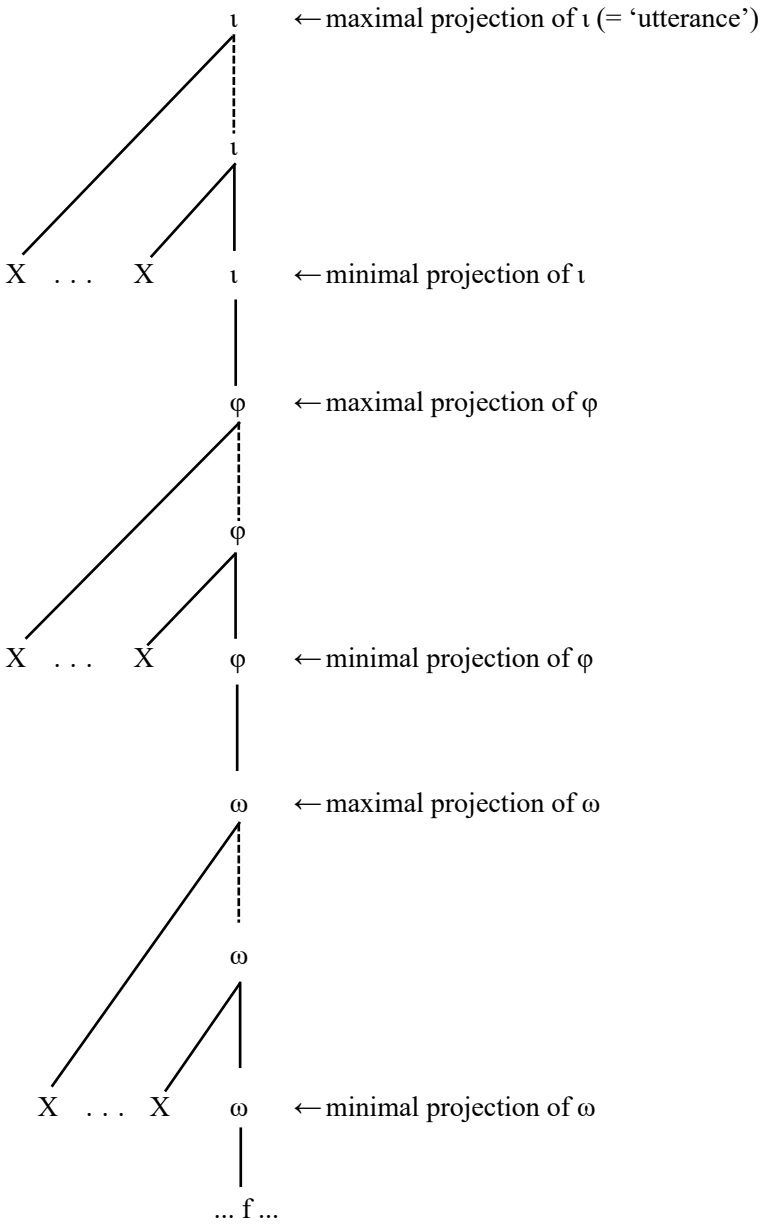
To begin with, I will assume Uriagereka's (1999) Multiple Spell-Out (MSO) model in addressing the issue of why CP in a noncanonical position constitutes an IntP. Uriagereka's MSO model takes as a basis Kayne's (1994) Linear Correspondence Axiom (LCA), which states that if α asymmetrically c-commands β

in the syntactic structure, then α precedes β in the linear order. Note that LCA properly works only if there are only right-branching objects; if an internally complex left-branching object merges in a structure, Kayne's LCA cannot decide linear precedence between the terminals in the left-branching object and the terminals of the main cascade structure it merges with. Thus, in order to solve this problem, Uriagereka proposes that an internally complex left-branching object such as complex specifiers and adjuncts should go through early Spell-Out to fix a linear order inside the complex object, then the Spelled-Out object, which is regarded as a giant lexical compound after Spell-Out, is later plugged into a derivational cascade, successfully obeying Kayne's LCA. Following Uriagereka's MSO model, I will assume that a clause in noncanonical position undergoes early Spell-Out before it merges with a main cascade and that this Spell-Out makes a clause identified as an IntP in contrast to a clause in a canonical position, which does not do so:

(20) CP undergoing Spell-Out constitutes an Intonational Phrase.

For a prosodic hierarchy, I will adopt a recursive prosodic hierarchy proposed by Ito and Metser (2012, 2013), rather than the traditional strictly layered hierarchy, in which a given prosodic category must be composed of the immediately lower category and a given prosodic category must be exhaustively contained in the superordinate category (cf. Nespor and Vogel (1986), Selkirk (1984, 2009)).

(21) Three-Layer Hypothesis (Ito and Mester (2012: 288))



This prosodic structure (21) allows recursive occurrence of a prosodic category

including PrW (= the domain of word stress), PhP (= the domain of application of rhythm rules) and IntP, in contrast to the traditional strictly layered one. For instance, a minimal projection of IntP allows other elements to prosodically adjoin to it, forming an intermediate projection of IntP, i.e., a minimal projection of IntP is wrapped by the intermediate projection of IntP. In this paper, I will particularly exploit this recursive nature of the three layer hypothesis in the domain of IntP. Furthermore, according to Ito and Mester, a maximal projection of IntP corresponds to a traditional prosodic category, utterance (cf. Nespor and Vogel (1986), Selkirk (1984)) and the projection cannot be recursive; "its only role is to gather up the smaller chunks of prosodic structure" (Ito and Mester (2012: 288)).

Along with the recursive prosodic hierarchy, we need a system which rules out the overt C *that* at the edge of an utterance and rules in its occurrence at other positions. In order to implement this idea, let us assume a prosodic constraint, Strong Start, proposed by Harizanov (2014):

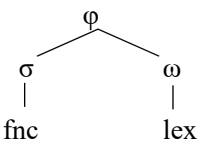
(22) Strong Start (Harizanov (2014: 116))
The leftmost constituent of a maximal Intonational Phrase should not be a prosodically deficient element (i.e. such an element must be parsed as inside a Prosodic Word).

Strong Start is originally proposed by Selkirk (2011), who discusses that no weak element can be found in relatively high positions of a prosodic hierarchy as a cross-linguistic tendency, which she assumes is due to Strong Start imposed on the phonological output. Building on her insight, Harizanov reformulates Strong Start to account for a Bulgarian clitic which cannot occur at the edge of a maximal projection of IntP (i.e. utterance-initial position). According to him, a Bulgarian clitic *mu* cannot occupy the utterance-initial position due to Strong Start (22), which bans the occurrence of prosodically deficient clitic at the edge of a maximal

projection of IntP. Because the reformulation of Strong Start provided by Harizanov in (22) fits well to the distribution of *that*, I will adopt his version of Strong Start as part of my analysis.

In relation to Strong Start, the prosodic nature of *that* needs to be identified. Selkirk (1996) argues that function words are usually phrased with the following PrW, which is typically a content word, to form a PhP:

(23)



Here, I am concerned with the prosodic status of *that* among function words, which is prosodically deficient/weak (σ) and does not form either PrW or PhP on its own in the normal environment.[3]

On the basis of the assumptions described above, I will propose the following mapping procedure for IntP to account for the whole distribution of Cs in English:[4]

(24) The mapping procedure of IntP

The leftmost constituent of *every* IntP constituted by CP must be checked by Strong Start. If the constraint is not satisfied, it remains to be the same IntP; otherwise IntP will form an utterance.

Let me further describe how the current proposal works when the mapping of IntP takes place:

(25) a. ( )ι

b. (α)ι → Strong Start

c. (σ)ι → Strong Start → (σ)ι

d. (ω)ι → Strong Start → (ω)υ

First, the IntP is formed based on syntactic information in (25a). In the next step (25b), Strong Start checks the prosodic status of the leftmost element of the relevant IntP. If the leftmost element is prosodically weak as in (25c), the IntP remains to be the same prosodic status; otherwise, the IntP is upgraded to the utterance as in (25d).

3.2 Analysis

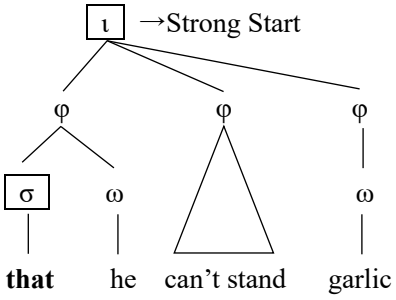
With everything in place, I will now move on to the analysis of Cs in English. I will start my analysis with a root clause, which is the most problematic for An's Null C Generalization. Since he bases his account on the unavailability of null Cs in noncanonical clauses, his analysis has to consider the most typical root clause as an exception, while my analysis does not have to. Remember that the overt *that* cannot occur in a root clause and the use of a null C is obligatory:

(26) a. [$_{CP}$ Ø He can't stand garlic].
b. *[$_{CP}$ That he can't stand garlic].

Since the structure contains no internally complex syntactic object, there is no early Spell-Out taking place in this case. Thus, IntP is formed to wrap the entire root clause after the whole CP is Spelled-Out. With these things in mind, let us consider how the current proposal works:

(27) a. *[$_{CP}$ That he can't stand garlic].
b. (that he can't stand garlic)ι →Strong Start
c. (that he can't stand garlic)ι

(28)



In (27a), the overt C *that* is contained in the root clause. At the timing when the root clause is mapped to the IntP, Strong Start is applied in (27b). At this point, *that* occupies the left edge of the IntP, as illustrated in (28). Remember that the function word *that* is a prosodically deficient element, which cannot constitute a PrW. Thus, the prosodically deficient *that* cannot satisfy the requirement of Strong Start. Consequently, the relevant IntP ends up being the same IntP status, resulting in an incomplete phonological representation, which is not wrapped by an utterance.[5]

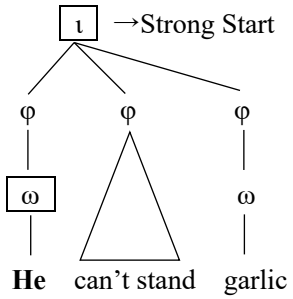
So far, I have tentatively assumed that the IntP remains to be the same IntP status unless Strong Start is satisfied. One may wonder why the leftmost element can affect the status of IntP which it is included in. With regards to this issue, Selkirk (2011: 470) argues that there is a tendency to place H* pitch accent on the leftmost PrW in an IntP in English. According to Pitrelli et al. (1994) and Jun (2014), the H* pitch accent is frequently used for canonical declaratives in English, showing a simple high intonation pattern. Additionally, as Selkirk (1996) suggests, pitch accents are associated only with stressed syllables in English, but not with function words in weak forms. Combining these observations, we may suppose that when the prosodically deficient element *that* occupies the edge of IntP, it prevents the H* pitch accent, which is a prosodic indicator for a declarative clause, from being placed at the left edge of the IntP. As a result, the relevant IntP lacks the H* pitch accent at the leftmost element, and thus leads to an incomplete

phonological representation for an utterance. Therefore, the IntP remains to be the same status if the prosodically deficient *that* occupies the edge of the IntP.[6]

How about the case with a null C contained in the same root clause?

(29) a. [$_{CP}$ Ø He can't stand garlic].
b. (He can't stand garlic)ι →Strong Start
c. (He can't stand garlic)υ

(30)



In this case, Strong Start kicks in (29b) with the subject *He* occupying the edge of IntP. Thus, in (30), the subject pronoun *He* forms a PrW and it can properly satisfy Strong Start.[7] Then, the IntP properly forms an utterance, resulting in a complete phonological representation (29c). Thus, the system correctly predicts the (un-)availability of the overt/covert Cs in the root clauses.

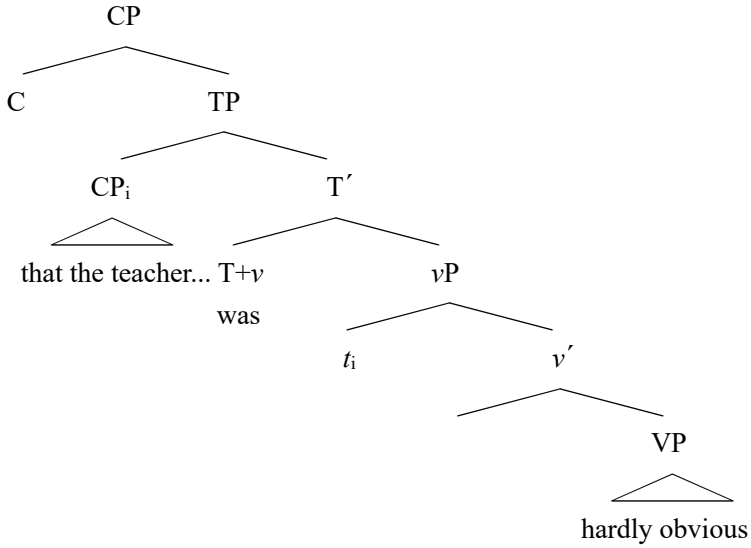
Let us now turn to the clausal subject, in which an overt C must be contained in the embedded clause:

(31) a. [$_{CP}$ That [$_{IP}$ the teacher was lying]] was hardly obvious.
b. *[$_{CP}$ Ø [$_{IP}$ the teacher was lying]] was hardly obvious.

Under Uriagereka's MSO model, a clausal subject is an internally complex left-branching object, thus it needs to undergo early Spell-Out before it merges with a

main derivational cascade on the usual assumption that a subject first merges in the Spec *v*P, and goes up to the Spec TP. Since it needs to go through Spell-Out, CP constitutes an independent IntP:

(32)



(33) a. [$_{CP}$ That the teacher was lying] was hardly obvious.
b. (That the teacher was lying)ι →Strong Start
c. (That the teacher was lying)ι
d. ((That the teacher was lying)ι was hardly obvious)ι →Strong Start
e. ((That the teacher was lying)ι was hardly obvious)υ

In (33b), the clausal subject forms an independent IntP when it goes through early Spell-Out. Then, the target of Strong Start is the prosodically weak element *that*, which violates the constraint, so the IntP remains to be the same IntP status in (33c). After the entire root clause is Spelled-Out, the root clause containing the clausal subject is mapped to the IntP and Strong Start kicks in again. In (33d), at first sight, the leftmost element seems to be the same *that* as the last time. However, because Strong Start has already been applied to the IntP wrapping the clausal subject, whose

status is like a giant lexical compound in Uriagereka's term, the inside of the IntP is opaque to the following application of Strong Start. Thus, it is the entire IntP *that the teacher was lying* that is the target of Strong Start this time. Then, since the current leftmost element, IntP, is strong enough to satisfy the constraint, the root clause properly forms the utterance, which is a proper phonological representation, as in (33e).

By contrast, when a null C is used in the clausal subject, the mapping of IntP proceeds as follows:

(34) a. *[$_{CP}$ Ø the teacher was lying] was hardly obvious.
b. (the teacher was lying)ι →Strong Start
c. (the teacher was lying)υ
d. (the teacher was lying)υ (was hardly obvious)ι →Strong Start
e. (the teacher was lying)υ (was hardly obvious)υ

In the same vein, the clausal subject containing the null C goes through early Spell-Out, and the whole CP is later plugged into the main cascade in syntax. At this point, the clausal subject constitutes an IntP, to which Strong Start is applied. I assume that the leftmost element is *the teacher*, which consist of the article *the* and the noun *teacher*, forming one PrW, following Ito and Mester (2009).[8] In (34b), where the leftmost element is the PrW *the teacher*, Strong Start is satisfied and the utterance is formed in (34c). In the next step, the rest of the root clause is mapped to the IntP and another utterance is formed.[9] Finally, as (34e) shows, this yields the two separate utterances as a final representation.

With regard to the role of utterance, Ito and Mester imply that it gathers up all the smaller chunks of prosodic constituents as I mentioned. For concreteness, Nespor and Vogel (1986) define the domain as follows:

(35) *U domain* (Nespor and Vogel (1986: 222))
The domain of U consists of all the *I*s corresponding to X^n in the syntactic tree.

Here, *I*s stand for IntPs and X^n means the string dominated by the highest node of a syntactic tree. Simply put, one utterance must dominate all the IntPs which dominate all the terminals of one syntactic tree. Since Nespor and Vogel's strictly layered prosodic structure is different from the one I assume here, (35) may not be directly applicable in our recursive hierarchy, but still their basic insight holds: it is plausible to assume that one utterance needs to wrap all the terminals of one syntactic tree even for the recursive prosodic hierarchy. Therefore, the representation in (34e), in which the two separate utterances are made for one syntactic tree, is by definition ill-formed.

Turning to the topicalized clause, the same line of approach can be made to this case as well:

(36) a. ((That the teacher was lying)ι, Ben already knew)υ
b. (the teacher was lying)υ, (Ben already knew)υ

For the topicalized clause, following Rizzi (1997), I assume that it merges in the Spec, TopP. When the topicalized clause internally merges in the position from the complement of the verb, it undergoes early Spell-Out since it is an internally complex left-branching object. Then, the topicalized clause is firstly mapped to PF, constituting an IntP. If the topicalized clause contains *that*, it still remains to be an IntP due to Strong Start, and it is later wrapped by the whole utterance which the entire sentence constitutes. In contrast, the use of the null C in the topicalized clause creates an independent utterance by the application of Strong Start, yielding the two separate utterances illicitly.

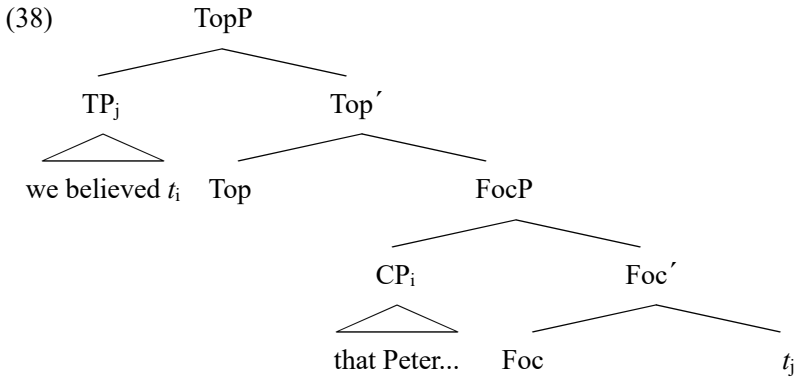
Next, with regard to the RNR construction, it is the case that the RNRed clause in the construction needs an overt C as well:

(37) a. They suspected and we believed [$_{CP}$ that [$_{IP}$ Peter would visit the hospital]].

b. * They suspected and we believed [$_{CP}$ Ø [$_{IP}$ Peter would visit the hospital]].

Following Bošković (2004), I will take PF-deletion + heavy NP shift (HNPS) analysis for the RNR construction. In this analysis, the construction involves PF-deletion of a shared element in the first conjunct and the same shared element in the second clause undergoes HNPS within the clause. With respect to HNPS, Bošković does not elaborate the technical details of the movement, thus I will adopt Mimura's (2009) analysis on HNPS. Assuming Rizzi's (1997) split CP hypothesis, Mimura proposes that the HNPS should be derived by two steps of movements: first, the shifted NP internally merges to the Spec, FocP, and subsequently the whole TP internally merges to the Spec, TopP above the FocP. Because the HNPS exhibits Focus properties such that it represents new information, bearing a focal stress and that it can be an answer to interrogative sentence as well, Mimura supposes that the shifted NP internally merges to the Focus phrase. By combining Bošković's analysis on the RNR with Mimura's analysis on HNPS, it follows that the shared element in the first conjunct undergoes PF-deletion and meanwhile the same shared element in the second conjunct internally merges to the Spec, FocP, followed by internal merge of TP to Spec, TopP. Remember that an internally complex left-branching object needs to undergo early Spell-Out for linearization under Uriagereka's MSO model, thus the shifted NP in the second clause will constitute an IntP:

(38)



(39) a. (They suspected (and we believed (that Peter would visit the hospital)ι)ι)υ

b. (They suspected (and we believed)ι)υ (Peter would visit the hospital)υ

Thus, the IntP wrapping the shifted clause is firstly formed and Strong Start applies to it. If the relevant clause contains *that*, it will violate the constraint, remaining to be the same IntP and later wrapped by the utterance which the whole sentence will constitute in (39a); meanwhile, if the relevant clause contains a null C, it will end up becoming an independent utterance separated from the rest of the sentence, resulting in the inappropriate two separate utterances in (39b).

Let us now turn to the case of the gapping construction.

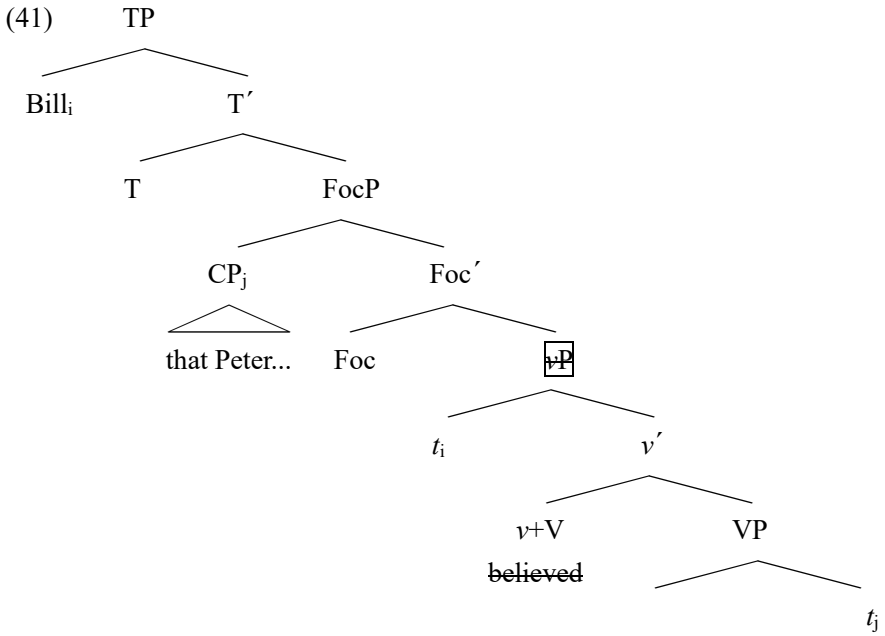
(40) a. Mary believed that Peter finished school and Bill [$_{CP}$ that [$_{IP}$ Peter got a job]].

b. * Mary believed that Peter finished school and Bill [$_{CP}$ Ø [$_{IP}$ Peter got a job]].

With regard to the gapping construction, I assume that the clausal complement internally merges from the complement of the verb to FocP above *v*P, followed by

PF-deletion of *v*P in the second conjunct, following Aelbrecht (2010) and Gengel (2007). The point is that the internally complex CP needs to go through early Spell-Out before merging to Spec, FocP, thus forming an IntP. The structure of the second conjunct is as follows:

(41)



(42) a. (Mary believed that Peter finished school (and Bill (that Peter got a job)ι)ι)υ

b. (Mary believed that Peter finished school (and Bill)ι)υ (Peter got a job)υ

Due to the early Spell-Out, the complement clause following the gapped element is firstly mapped to PF, then the relevant clause forms an independent IntP. At this point, the IntP is subject to Strong Start: if the clause contains *that*, the relevant IntP violates the constraint, and hence it remains to be the same IntP status, later wrapped by the utterance in (42a). On the other hand, in (42b), in which the clause contains

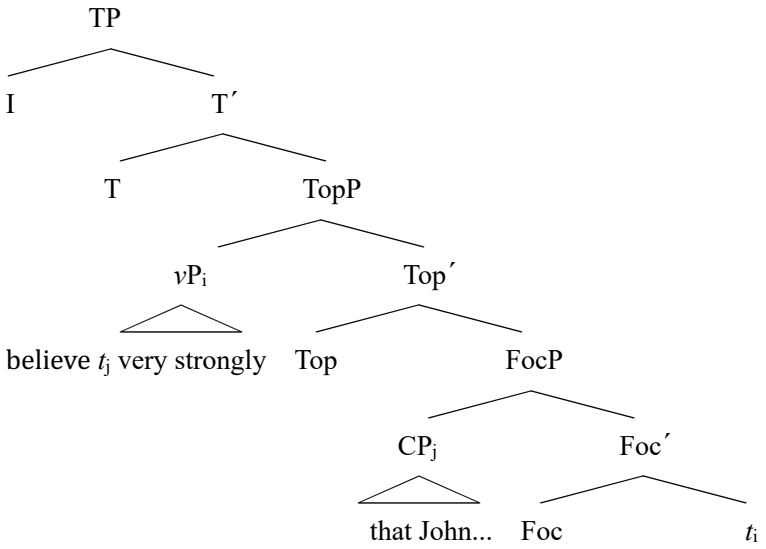
Ø, the IntP is upgraded to an independent utterance, resulting in the two separate utterances as an illicit representation.

Let us turn to the extraposed clause.

(43) a I believe very strongly [$_{CP}$ that [$_{IP}$ John liked linguistics]].
b. *I believe very strongly [$_{CP}$ Ø [$_{IP}$ John liked linguistics]].

Here, my assumption concerning the extraposition is similar to that of the RNR construction. Grounded on crosslinguistic data, Drubig (2007) argues that information structure positions such as TopP and FocP exist at the *v*P level as well as CP level, and the surface word order variation is derived by extraction and remnant movement to the specifier of the functional heads such as TopP and FocP. In addition, Huck and Na (1990) argue that extraposition in English is a type of focus construction, which implies that the extraposed element internally merges to FocP. Putting these ideas together, I assume that the derivation of extraposition involves two steps of movements: first the extraposed element internally merges to the Spec, FocP above *v*P and the remnant *v*P internally merges to some functional projection above the FocP, maybe TopP in the Rizzi's split CP hierarchy. This derivation of extraposition forces the object CP to undergo early Spell-Out so that the ordering inside CP is fixed, and consequently the clause forms an independent IntP:

(44)



(45) a. (I believe very strongly (that John liked linguistics)ι)υ

b. (I believe very strongly)υ (John liked linguistics)υ

Given the reasoning I have developed so far, the extraposed clause, which undergoes early Spell-Out, is firstly mapped to PF, and Strong Start applies to the IntP wrapping the clause. At this point, whether or not the clause contains *that* or Ø decides the status of the relevant IntP. Consequently, the clause containing *that* will be wrapped by the entire utterance, yielding a proper representation in (45a), while Ø forces the IntP to form an independent utterance, resulting in an illicit representation consisting of the two utterances in (45b).

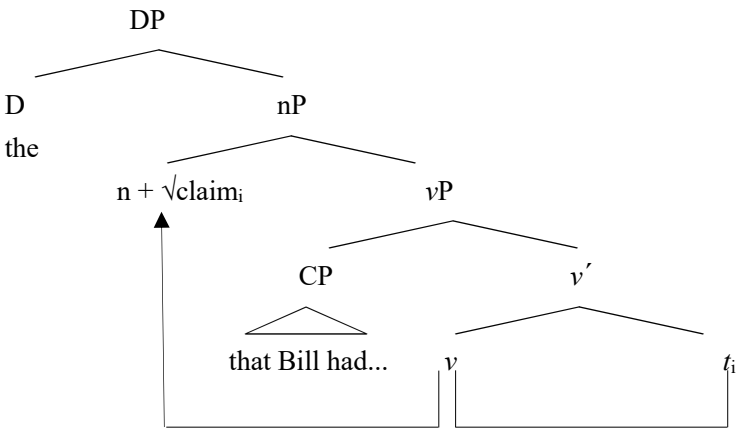
Next, let us consider the clausal complement of NP. As discussed in the previous section, the use of a null C is banned in the clausal complement of NP and the relevant clause must be parsed as a separate IntP:

(46) a. I distrust [$_{NP}$ the claim [$_{CP}$ that Bill had left the party]].

b. *I distrust [$_{NP}$ the claim [$_{CP}$ Ø Bill had left the party]].

In contrast to the previous examples, an overt movement does not seem to involve this construction. On the other hand, it is worth noting that the head of NP *claim* is the nominalized form of the corresponding verb without an overt nominalizing morpheme. Considering this fact, I assume the structure for complex NP involving the nominalization like the following (cf. Harley 2009):

(47)



(48) a (I distrust the claim (that Bill had left the party)ι)υ

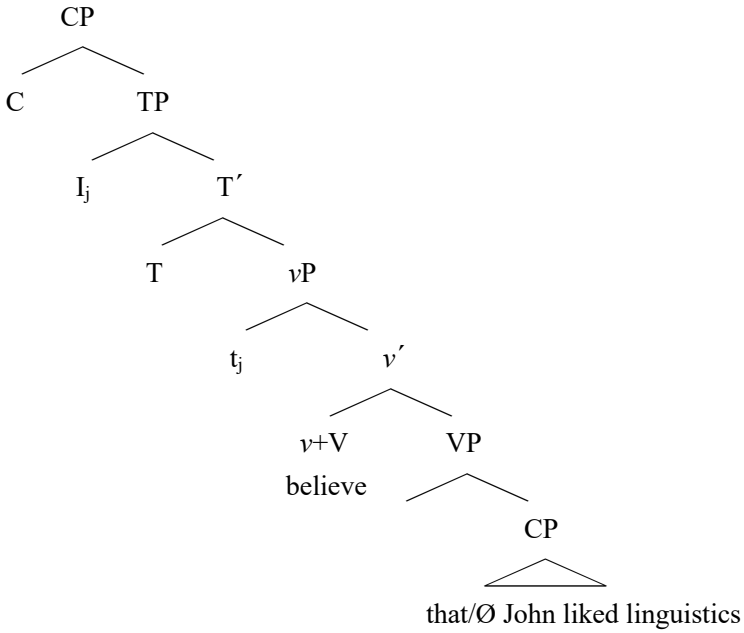
b. (I distrust the claim)υ (Bill had left the party)υ

As illustrated in (47), the clausal complement is merged in the Spec, *v*P. On the assumption we have made, the clausal complement needs to go through early Spell-Out, so that the IntP is formed to wrap the relevant clause. Then, it will be the target of Strong Start and the resulting representation is shown in (48); depending on the use of *that*/Ø, we have different phonological representations. Here, note that the ungrammatical sentence (48b) sounds as if there were two separate sentences, "*I distrust the claim*" and "*Bill had left the party*," given the IntP boundary, which is indicated by a pause, between the two clauses. Thus, this example specifically illustrates the prosodic effect of the presence of *that* in the embedded clause in the noncanonical position.

As we have seen above, the clauses at the noncanonical positions can be explained properly as well as the root clause by our approach. Let me finally touch on a clause in a canonical position, that is, the complement of a verb:

(49) a. I believe [$_{CP}$ that/Ø John liked linguistics].
b. (I believe that/Ø John liked linguistics)ι →Strong Start
c. (I believe that/Ø John liked linguistics)υ

(50)



Because the clause in the canonical position does not involve any movement from the base-generated position as in (50), the complement clause does not undergo early Spell-Out; the clause does not constitute an IntP like the clauses in the noncanonical positions. Instead, the IntP is formed to wrap the entire sentence, as shown in (49b). Both overt/covert Cs in the embedded clause do not occupy the left edge of the IntP. In other words, the PrW *I* is the one that occupies the edge of the IntP. Therefore, the IntP properly forms the utterance via the application of Strong Start, regardless

of the use of either *that* or Ø in the embedded clause, as shown in (49c). Thus, the current approach properly predicts the availability of both overt/covert Cs in the canonical embedded clause.[10]

4. Conclusion

In this article, I have explained the distribution of Cs in English by the cyclic application of Strong Start to IntPs, by which the status of the relevant IntPs is decided. Especially, as opposed to the many previous works, the proposed analysis focuses on the distribution of *that*, rather than null Cs, providing a new perspective to capture the (un-)availability of both overt/covert Cs. Additionally, I provided an account for the question of why clauses at noncanonical positions must be parsed as IntPs, by assuming that CP undergoing Spell-Out constitutes an IntP.

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Notes

1) An (2007) assumes that phonological phrase between IntP and prosodic word does not exist in the prosodic hierarchy in English, following Selkirk (1984).

2) (15) illustrates an example of an extraposed relative clause, which needs overt relative pronoun at the edge of IntP. Taking the similar behavior of relative pronouns into account, An (2007) proposes Intonational Phrase Edge Generalization (IPEG):

(i) Intonational Phrase Edge Generalization (IPEG) (An (2007: 61))
The edge of an I-phrase cannot be empty (where the notion of edge encompasses the specifier and the head of the relevant syntactic constituent).

Though (15) is the example of an extraposed relative clause, the fundamental mechanism of the Null C Generalization and the IPEG is the same, so I use (15) for the expository purpose.

3) See Sato and Dobashi (2016) for their analysis on *that*-trace effect caused by the prosodically weak nature of *that*.

4) Strictly speaking, this proposal regards utterance as a different level of constituent from IntP in that Strong Start must be met for the formation of utterance against Ito and Mester's assumption. I will not discuss the matter in detail, but it is an interesting topic worth pursuing, so I will leave it for future research.

5) According to Beijar (2002: 13), when a *that*-clause is used as an exclamative, it needs to have "an exclamative intonation contour" as in (ib), while when pronounced with a usual sub-clause intonation contour, it could not stand on its own as in (ia) and needs to be a part of a sentence as in (ic):

(i) a. * That he should have left without me.
b. That he should have left without me!
c. That he should have left without me, seems possible. (Beijar (2002: 13))

It is uncertain exactly what Beijar means by "exclamative intonation contour," but it is likely that the sentence-initial *that* is pronounced differently from the one in the declarative clause. Note that when function words are focused, they appear in strong forms, which can form PrWs, as discussed in Selkirk (1996). I hypothesize that the use of *that* in the apparent root clause is licensed by focalization, which upgrades the prosodic status of *that* to a PrW, therefore the IntP containing *that* can satisfy Strong Start.

6) The current proposal may be paraphrased as "place H* pitch accent at the leftmost edge of utterance for a declarative clause." However, because I have not found enough data showing that the pitch accent is actually placed on the left edge of IntP in the relevant constructions, I simply use Strong Start as an explanatory tool.

7) One might wonder if the personal pronoun *he* can form a PrW. Because it is also a function word, it is predicted that it does not bear stress and cannot form a PrW if we strictly follow Selkirk (1996). To my best knowledge, a number of previous works show that pronouns used in an object position can be reduced, which in turn proves that they are prosodically weak elements, while very few studies address the prosodic status of pronouns in a subject position. Here, I consider that nominative pronouns such as *he* and *I* form PrWs, which are sometimes pronounced weakly, as Dobashi (2019) discusses.

8) One might wonder if the same thing holds for *that* and a following subject. Ito and Mester base their account on prosodic tests on the sequence of *fnc-lex* such as DP, IP and PP, showing that they own PrW properties, while they do not address *that*. Additionally, I found it hard to see whether *that* is within a PrW or not by their prosodic tests due to its prosodic nature. It is worth noting that the syntactic relations of D and NP, I and VP, and P and NP are all head-complement relations, whereas *that*, the head of C, is phrased with a following subject in the Spec, IP. This syntactic nature may be

reflected in the phonology, yielding the difference in their prosodic status. However, this is a mere stipulation, so I will leave it for future research.

9) One might wonder if another representation is the case for the ungrammatical sentences:

(i) ((the teacher was lying)υ was hardly obvious)υ

In this representation, the two utterances occur recursively. Though I am not sure which mapping is correct, the representation in (i) should be ruled out due to the recursion of the utterances, because Ito and Mester (2012, 2013) assume that the recursion cannot occur at the utterance level. I will not go into details and leave the question open for future research.

10) In this paper, I assume that there are two distinct Cs, Ø and *that*, for finite declarative clauses in English. However, if the current analysis is on the right track, there is the possibility that we do not need to assume the two lexical items. Given that there is only one C for finite declarative clauses in lexicon and that its phonological exponent *that* can be inserted at PF, as suggested by Franks (2005), we may assume that the insertion of *that* to the edge of IntP constituted by a noncanonical clause is obligatory before the application of Strong Start. It is worth pursuing the idea, but the page limit does not allow me to do so, so I will leave it for future research.

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