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Against Anti-Locality in A'-Movement*

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ABSTRACT

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The goal of this paper is to declare that anti-locality based on the Spec-to-Spec Anti-Locality (SSAL) is not effective in accounting for *that*-trace effects. It is illustrated that there are many pieces of conceptual and empirical evidence against the SSAL. Accordingly, the anti-locality account for *that*-trace effects cannot be accepted. This paper proposes that what is crucial in alleviating *that*-trace effects is the property of intervening elements between CP and TP, not just the SSAL. Unfortunately this paper does not provide a comprehensive account covering all the examples regarding the adverb effect, topic islands, and fronted focus elements. With a simple conclusion that the anti-locality approach can never account for *that*-trace effects, we are looking forward to an analysis attributing a difference in the property of intervening elements between CP and TP to a structural difference based on a refined CP structure.

KEYWORDS

1. Introduction

It has been widely accepted that movement proceeds locally. That is, there must be an upper bound in the distance of each step of movements. This idea has been called in many terms: locality, (relativized) minimality, successive cyclicity, and Subjacency, etc. So every movement is assumed to proceed in a cyclic fashion in order to avoid too long movements. Multiple Spell-Out based on a phase also bears an impact on successively cyclic movement. Consider the derivational process of the following sentences.

(1) a. [CP Who do you think [CP __ Mary said [CP __ John kissed __]]]?
    b. [TP Mary seems [TP __ to be likely [TP __ to have been kissed __]]].

The interrogative pronoun *who* in (1a) is assumed to move through the SPEC of each CP and the noun phrase *Mary* in (1b) is also assumed to move through the SPEC of each TP in order to satisfy the locality condition.

On the other hand, some scholars including Bošković (1994, 1997), Grohmann (2003, 2011), Ishii (1997), and Saito and Murasugi (1999) suggested that there must be a lower bound in movement distance in addition to an upper bound. That is, movement must not be too local or short. This idea is called anti-locality. Too short movements like the following are ruled out, not being in accordance with anti-locality.

(2) a. *John likes.
    b. [VP John likes ~~John~~]¹

In (2) *John* moves from the COMP position to the SPEC position of the same head. Since this movement is too local, it is blocked, resulting in the ungrammaticality of (2a). After all, for the clear definition of the concept of "too short" the following constraint is suggested.

(3) Constraint on Chain Links (CCL, from Grohmann 2011:266)
    Each chain link must be at least of length 1, where a chain link from α to β is of length n iff there are n-XPs that dominate α but not β.
(4) [VP John [V' like ~~John~~]]

According to the definition of the CCL, the chain link in (4) is of length 0, because there is no XP between two links of *John*. Accordingly the CCL blocks movement from COMP to SPEC.

On the basis of this anti-locality hypothesis Erlewine (2014, 2017) argues that A'-movements have to obey anti-locality, and that *that*-trace effects can be accounted for naturally and uniformly.

(5) a. *Who does Bill think that __ saw John?
    b. Who does Bill think that John saw __?
(6) a. [CP1 who ... [CP2 ~~who~~ that [TP ~~who~~ saw John]]]
    b. [CP1 who ... [CP2 ~~who~~ that [TP John [vP saw ~~who~~]]]]

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¹ In this paper the copy theory of Chomsky (2001, 2004) is adopted. Only the higher copy in structure is pronounced. The unpronounced copy in a lower position is represented with a strikethrough like *~~John~~*.

Since movement must be successive-cyclic, *who* in (5a) moves from TP-Spec to CP2-Spec, and next to CP1-Spec as shown in (6a). The first step from TP-Spec to CP2-Spec is too short and is ruled out by the anti-locality condition. On the contrary, *who* in (5b) moves from within vP to CP2-Spec, and next to CP1-Spec as shown in (6b). The first step from within vP to CP2-Spec is not too short and is accepted. Erlewine argues that this is the reason the subject-object asymmetry in (5) regarding the overt complementizer *that* takes place.

Erlewine (2014, 2017) suggests the following Spec-to-Spec Anti-Locality to make the concept "too local" clear.

(7) Spec-to-Spec Anti-Locality (SSAL)
   A'-movement of a phrase from the specifier of XP must cross a maximal projection other than XP.
   Movement from position α to β crosses γ if and only if γ dominates α but does not dominate β.
(8) Crossing
   Movement from position α to position β crosses γ if and only if γ dominates α but does not dominate β.

The SSAL rules out the movement like (9a).

(9) a. *[$_{CP}$ who [$_{C'}$ C [$_{TP}$ ~~who~~ ...]]]
   b. [$_{CP}$ who [$_{C'}$ C [$_{TP}$ ... [$_{vP}$ ... ~~who~~]]]]

The movement from TP-Spec to CP-Spec in (9a) crosses no maximal projection (MP, henceforth) other than TP, not obeying the SSAL. However, the movement of *who* in (9b) obeys the SSAL, because there is another MP (=TP) other than vP.

Now let us consider the case where a null complementizer appears.

(10) [$_{CP}$ Who does Bill think [$_{CP}$ Ø [$_{TP}$ ~~who~~ saw John]]]?

Erlewine (2017) claims that one-fell-swoop movement of the wh-subject shown in (10) is possible because there is no ordering paradox, which is suggested by Fox and Pesetsky (2005). They propose that linear order relations are established cyclically, after the construction of each phase.[2] Now consider if there is ordering paradox in the derivation shown in (10).

(11) a. Linear order relations at embedded CP Spell-Out:
      who ⟨ saw ⟨ John
    b. Linear order relations at matrix CP Spell-Out:
      who ⟨ does ⟨ Bill ⟨ think ⟨CP
      ⇒ no ordering paradox

As illustrated in (11), there is no ordering paradox between words. Since one-fell-swoop movement of the wh-subject is possible in the case of the null complementizer, there is no SSAL violation. Erlewine (2017) claims that this is the reason *that*-trace effects do not occur in a null complementizer.

This kind of one-fell-swoop movement of the subject is not possible, however, in the overt complementizer *that*.

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[2] Fox and Pesetsky (2005) propose that this cyclic linearization account is the source for phase impenetrability effects on overt movement.

(12) [_{CP} Who does Bill think [_{CP} that [_{TP} ~~who~~ saw John]]]?
    a. Linear order relations at embedded CP Spell-Out:
       that ⟨ who ⟨ saw ⟨ John
    b. Linear order relations at matrix CP Spell-Out:
       who ⟨ does ⟨ Bill ⟨ think ⟨CP
        ⇒ ordering paradox: who ⟨ that ⟨ who

At embedded CP Spell-Out *that* precedes *who*, whereas at matrix CP Spell-Out *who* precedes *that*. So in the derivation like this there is an ordering paradox between *who* and *that*. This is the reason one-fell-swoop movement of the subject is allowed only in the null complementizer, not allowed in the overt complementizer.

This kind of explanation based on the SSAL seems plausible, but raises a lot of problems. This paper intends to consider whether the SSAL is really acceptable or not. In section 2, it is illustrated that there are many pieces of conceptual and empirical evidence against the SSAL. In section 3, we will consider whether the argument of no subject movement from TP-Spec to CP-Spec is really valid. In section 4, we revisit *that*-trace effects and note that the effects remain a puzzle. Finally section 5 concludes that the SSAL cannot be a right solution for *that*-trace effects.

2. Conceptual and Empirical Evidence against the SSAL

2.1 Empirical Evidence against the SSAL

The doubt on the validity of the SSAL begins from the observation that it does not apply to A-movement. According to the VP-Internal Subject Hypothesis (VPISH) the subject is usually merged in vP-Spec, and moves to TP-Spec like the following.[3]

(13) [_{TP} John T [_{vP} ~~John~~ loves Mary]].

This A-movement of the subject (=*John*) crosses no MP other than vP, violating the SSAL. This leads us to conclude that the SSAL applies only to A'-movement. The conclusion does not constitute real evidence against the SSAL, however, because Erlewine (2014, 2017) confines the SSAL only to A'-movement. The question raised in this context is why the SSAL applies only to A'-movement. As long as we cannot find a reason for the restriction, we cannot but doubt the validity of the argument that the SSAL applies only to A'-movement.

Leaving this problem aside for the time being, let us consider the cases where even A'-movements do not obey the SSAL. First, in the Subject Condition, the opposite result of the SSAL's prediction takes place.

(14) a. *[_{CP} Who is [_{TP} [_{DP} a picture of ~~who~~] ~~is~~ on sale]]]?
    b. *[_{CP} Of whom is [_{TP} [_{DP} a picture ~~of whom~~] ~~is~~ on sale]]]?
(15) [_{CP} A picture of whom is [_{TP} [_{DP} ~~a picture of whom~~] ~~is~~ on sale]]]?

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[3] This movement is usually assumed to be induced by the edge feature of T (or the EPP property).

In (14), the movement of *who/of whom* obeys the SSAL because there is another MP (=TP) other than DP in crossing. Nevertheless the examples in (14) are ungrammatical contrary to the prediction.[4] On the contrary, the whole DP subject movement in (15) results in a grammatical sentence even though it violates the SSAL. This consideration leads us to cast doubt on the validity of the SSAL.

Second, there is another piece of evidence from the following Chamorro example cited from Radford (2009:337) that A'-movements can undergo too short movement.

(16) Hafa s*in*anganemña si Joaaquin nu hagu b*in*indenña.
    what   told   the Joaquin to you sold
    'What did Joaquin tell you that he sold?'

In (16), the direct object *hafa* 'what' moves from the object position of the embedded clause to the front of the main clause, and "this movement triggers agreement on both the verb in the embedded clause and the verb in the main clause, each of which therefore end up carrying the italicized (object-agreement) infix *in*. This suggests that a transitive light verb carrying an edge feature attracts a wh-marked goal and undergoes overtly marked agreement with the goal" (Radford 2009:337).

The following representation shows how the movement of *what* proceeds, which illustrates the SSAL is violated in the first step.

(17) [$_{CP}$ What did Joaquin [$_{vP}$ ~~what~~ tell you [$_{CP}$ ~~what~~ that he [$_{vP}$ ~~what~~ [$_{VP}$ sold ~~what~~]]]]]?

Under the assumptions that both CP and vP are phases and that both C and v, heads of phases, have an edge feature, the interrogative phrase *what* has to move to the SPEC of each vP and each CP, attracted by the edge feature. The first step of the movement to the embedded vP-Spec violates the SSAL, because it does not cross any XP other than VP. But (16) is grammatical contrary to the prediction.

Third, subject relative pronouns do not obey the SSAL.

(18) I know the man [$_{CP}$ who [$_{TP}$ ~~who~~ loves the woman]].

As the example above shows, movement of the subject relative pronoun *who* from TP-Spec to CP-Spec is possible, even though it violates the SSAL.[5]

Brillman and Hirsch (2016) argue that subject relative pronouns do not move, citing the following examples from Chung and McCloskey (1983), which illustrate that subject relative clauses show weaker wh-island effects than non-subject relative ones.

(19) a. Paul and Stevie were the only ones [who wanted to record that song].
    b. Isn't that the song which Paul and Stevie were the only ones [who wanted to record ~~which~~]?

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[4] It can be argued that the Subject Condition is derived from something different irrespective of the SSAL, and that it does not constitute evidence against the SSAL. But it is notable that the Subject Condition is the exact opposite of the SSAL.

[5] When the subject is relativized, the exact opposite of *that*-trace effects takes place.
    (i) I know the man that __ loves the woman.
    (ii) *I know the man __ loves the woman.
  This puzzle is called "anti-*that*-trace effects," and has no satisfactory solution so far.

(20) a. Paul and Stevie were the only ones [who George would let ~~who~~ record that song].
     b. *Isn't that the song which Paul and Stevie were the only ones [who George would let ~~who~~ record ~~which~~]?

If we compare (19b) with (20b), subject relative clauses do not evoke wh-island effects unlike non-subject relative ones. If the subject relative pronoun does not move, as Brillman and Hirsch (2016) argue, the contrast can be naturally accounted for. In (19b), *which* can move to the SPEC of the most embedded CP and moves to the SPEC of the next embedded CP, because *who* does not move, whereas this kind of movement is not possible in (20b) because the object relative pronoun *who* already occupies the SPEC of the most embedded CP. So *which* has to move directly to SPEC of the next embedded CP, hence resulting in the violation of successive-cyclic movement.

     This kind of explanation is problematic, because if the subject relative pronoun remains in-situ within the embedded clause, the movement shown in the following example will be predicted to be grammatical, contrary to fact.

(21) a. *They were the only ones who I said that ___ had resisted my proposal.
     b. ... [$_{CP1}$ who [$_{TP1}$ I said [$_{CP2}$ that [$_{TP2}$ ~~who~~ had resisted my proposal]]]]

As (21b) shows, *who* can move directly from TP2-Spec to CP1-Spec satisfying the SSAL. Nevertheless (21) is ungrammatical, showing the *that*-trace effect. Hence even if it is assumed that the subject relative pronoun does not move to CP-Spec, the examples like (21) cannot be accounted for by means of the SSAL analysis.

     Fourth, the proposal that interrogative subjects move from TP-Spec to CP-Spec further makes the SSAL very dubious.[6] Consider the following example.

(22) a. Who loves Mary?
     b. [$_{CP}$ who [$_{TP}$ ~~who~~ loves Mary]].

As (22b) shows, the movement of *who* violates the SSAL because there is no MP other than TP. Nevertheless, (22a) is acceptable. This problem can be avoided as well, if interrogative subjects do not move as Brillman and Hirsch (2016) argue.

(23) [$_{CP}$ [$_{TP}$ who loves Mary]]

In (23) the subject interrogative pronoun *who* remains in TP-Spec, and so does not violate the SSAL. However, we cannot accept the solution based on the proposal that subject interrogative pronouns do not move to CP-Spec,[7] because it is problematic in many respects. The next section deals with the problems of this proposal in detail.

     In addition to the empirical evidence against the SSAL mentioned so far there is another phenomenon which further makes the SSAL dubious. Consider the following examples.

(24) a. Robin met the man {Op$_i$ that/who } Leslie said that for all intents and purposes t$_i$ was the mayor of the city.

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[6] If we accept Radford's (2009:161) Interrogative Condition that a clause is interpreted as a non-echoic question iff it is a CP with an interrogative specifier, interrogative subjects have to move to CP-Spec.

[7] This proposal is called as the Vacuous Movement Hypothesis (VMH), which argues that a movement whose effect cannot be observed must not be allowed.

    b. This is the tree Op$_i$ that I said that just yesterday t$_i$ had resisted my shovel.

    c. I asked what$_i$ Leslie said that in her opinion t$_i$ had made Robin give a book to Lee.

        (Culicover 1993:558)

As many scholars have pointed out, intervening adverbs obviate or alleviate *that*-trace effects, which is called the adverb effect by Culicover (1993). Various accounts for the effect have been offered in Culicover (1993), Browning (1996), and Rizzi (1997).

    Brillman and Hirsch (2017) argue that the adverb effect can be naturally accounted for by means of the SSAL.

(25) a. *Who did John say [$_{CP}$ __ that [$_{TP}$ __ ran to the store]]?

    b. Who did John say [$_{CP}$ __ that [$_{AdvP}$ fortunately [$_{TP}$ __ ran to the store]]]?

    c. *Who did John say [$_{CP}$ __ that [$_{TP}$ __ [$_{AdvP}$ quickly [$_{vP}$ ran to the store]]]]?

The *that*-trace effect is obviated by the addition of structurally high adverbs as in (25b), which makes the distance between CP and TP long enough to obey the SSAL. But the addition of lower manner adverbs as in (25c) does not make any difference because they are adjoined to vP, not to TP (This is noted by Rizzi (1997:311).).

    Erlewine (2017) also supports the obviation of *that*-trace effects by means of the SSAL with the following examples from Rizzi and Shlonsky (2007).

(26) a. *What do you think [$_{CP}$ __ that [$_{TP}$ __ is [$_{Pred}$ __ in the box]]]?

    b. What do you think [$_{CP}$ __ that [$_{TP}$ there is [$_{Pred}$ __ in the box]]]?

Erlewine (2017:375) claims that the contrast in (26) serves to show that "the *that*-trace effect is not simply sensitive to the extraction of local subjects, but rather specifically to extraction from the Spec,TP derived subject position." That is, (26b) is acceptable because the movement of *what* is not too local, moving from PredP-Spec, not from TP-Spec.

    Though the SSAL approach to the adverb effect seems plausible, it is not obvious whether intervening adverbials between CP and TP really select TP as a complement.

(27) Who does John think [that [for all intents and purposes] [__ served as president]]?

(28)
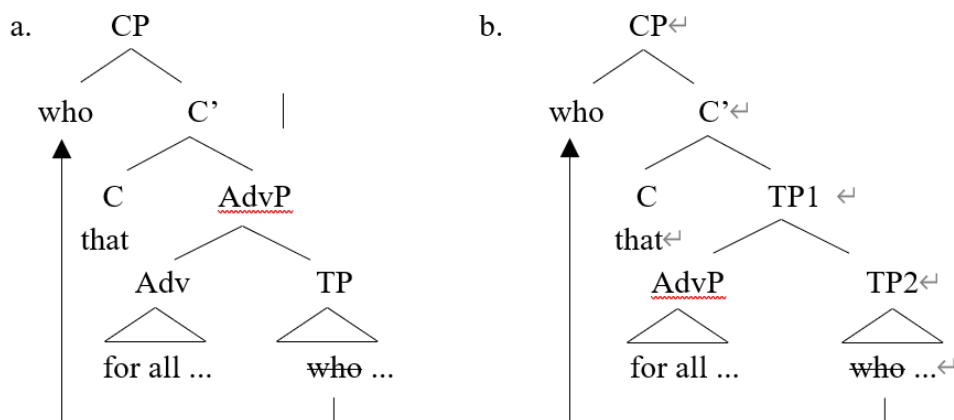
Erlewine (2017) and Brillman and Hirsch (2017) argue that (28a) is the right structure for the embedded clause of (27), and that the movement of *who* obeys anti-locality because there is another MP (=AdvP) between CP and TP. However, considering that adverbials are a kind of adjuncts, (28b) seems a more adequate structure in that adjuncts are adjoined to TP.[8] If (28b) is the right structure, the movement of *who* does not obey anti-locality, because *who* does not cross any MP other than TP. (AdvP is dominated by one segment of TP (=TP1), and is not excluded from TP. Accordingly the movement of *who* does not cross AdvP.)

The SSAL approach to the adverb effect is further dubious, considering the following examples from Rizzi (2004:241).

(29) a. *This is the man who I think that t will buy your house next year.
    b. This is the man who I think that, next year t will buy your house.
    c. *This is the man who I think that, your house, t will buy next year.
(30) [CP who that [TopP your house [TP ~~who~~ will buy ~~your house~~ next year]]]

Fronted temporal adjuncts like *next year* makes it possible for a subject wh-phrase to move, enabling the *that*-trace effect to be obviated. On the contrary, fronted arguments block the movement of a subject wh-phrase even though the movement obeys the SSAL, because there is another MP (=TopP) between TP and CP, as shown in (30).[9] This illustrates that what is crucial in movement of an embedded subject wh-phrase is the nature of the intervening element between *that* and a trace, not the structure.[10]

It can be argued that fronted arguments constitute a kind of topic island so that they block extraction of all arguments irrespective of the SSAL. Therefore (29c) has nothing to do with *that*-trace effects. Consider the following examples.

(31) a. *Who did Leslie think that, this present, Kim gave to?
    b. *To whom did Lee think that, this present, Robin gave?
    c. *Who did Robin say that, this present, gave Lee?
    d. *What did Lee insist that, for Kim, Robin should buy? (Browning 1996:250)

These examples show that fronted arguments make it impossible to extract any wh-phrase to their right side.[11]

Moreover, there are some temporal adverbials which do not allow extraction of arguments and which do not

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[8] As an anonymous reviewer points out, (28b) is more adequate in that for all intents and purposes is AdvP, not Adv.

[9] In this paper it is assumed that fronted arguments occupy the SPEC of TopicP in accordance with the refined or articulated CP structure suggested by Rizzi (1997).

[10] It does not mean that an approach based on structural difference cannot account for the difference between adjuncts and arguments with regard to *that*-trace effects. We just mention that a proper analysis based on structural difference has not been provided so far. Some scholars including Browning (1996) and Douglas (2017) suggest their own accounts based on structural difference.

[11] However, even fronted arguments allow extraction of wh-adjuncts such as *why* and *how*, as shown in the following examples from Browning (1996:250).
    (i) Why do you think that, this book, Lee assigned to the intro class?
    (ii) Why do you think that, to those students, Kim gave such low grades?
    (iii) How do you think that, this problem, Robin would solve?
    That is, it is not the case that fronted arguments block all kinds of wh-movements.

alleviate *that*-t effects.

(32) a. *This is the linguist who I think that t will get appointed in Geneva.
     b. This is the linguist who I think that next year t will get appointed in Geneva.
     c. *This is the linguist who I think that t expects that all his students will have a job.
     d. *This is the linguist who I think that next year t expects that all his students will have a job.

(Haegeman 2003:644)

Temporal adverbials are divided into two types: short fronted adjuncts and long fronted adjuncts.

(33) a. Next year I will get appointed in Geneva.
     b. Next year I expect that all his students will have a job.

In (33a) *next year* denotes the time of my being appointed. That is, it is within the clause it denotes. On the contrary, in (33b) *next year* is in the matrix clause even though it denotes the time of the event described in the embedded clause. (33a) is an example of short fronted adjuncts whereas (33b) is an example of long fronted adjuncts. The former may alleviate *that*-trace effects, but the latter does not. What is clear from these considerations is that something more complicated rather than the SSAL intervenes in the obviation of *that*-trace effects.

Unlike fronted topics, fronted focuses still obviate *that*-trace effects. Consider the difference between topics and focuses.

(34) a. These books I read in a day.
     b. This latter topic we have examined in Chapter 3.
     c. Into the basket we asked him to put the bananas.
(35) a. Never have we seen such a spectacle as this.
     b. Not a word did he say.
     c. At no time was she as beautiful as now.

The underlined parts in (34) are topics whereas those in (35) are focuses (cf. Haegeman and Guéron (1999)). The latter includes a negative word, and induces subject-auxiliary inversion (SAI). The crucial difference between topic constructions and focus constructions is that SAI takes place only in the latter. Now let us consider how fronted focuses work in the obviation of *that*-trace effects.

(36) Leslie is the person who I said that under no circumstances __ would run for president.

A fronted focus does not block movement of a wh-relative. It means that unlike fronted topics, fronted focuses obviate *that*-trace effects. From these considerations we conclude that what is crucial in obviating *that*-trace effects is the nature of the intervening element between CP and TP, not just the SSAL.

These considerations are enough to reject the account of *that*-trace effects based on anti-locality (the SSAL), even though a comprehensive account covering all the examples regarding the adverb effect, topic islands, and fronted focus elements has not been provided in this paper.

2.2 Conceptual Evidence against the SSAL: the Phase Impenetrability Condition

Erlewine (2017) proposes that in the case of a null complementizer the subject in the embedded TP-Spec directly moves to the matrix CP-spec, without moving through the embedded CP-Spec like the following.

(37) [$_{CP}$ Who does [$_{TP}$ Bill think [$_{CP}$ Ø [$_{TP}$ ~~who~~ saw John]]]]? (=(10))

Chomsky (2001, 2004) suggests that syntactic structure is built in phases. At the end of each phase, part of the syntactic structure undergoes transfer to the phonological and semantic components. This phase-by-phase transfer is called Multiple Spell-Out. Once all the operations within a given phase have been completed, the domain (i.e. the complement) of the phase becomes impenetrable to further syntactic operations of the next phase. This condition is called the Phase Impenetrability Condition (PIC) by Chomsky.

(38) Phase Impenetrability Condition (PIC) (from Radford 2009:324)
    The c-command domain of a phase head is impenetrable to an external probe. (i.e. a goal which is c-commanded by the head of a phase is impenetrable to any probe c-commanding the phase.)

CP and vP are usually regarded as phases.[12] However, for the convenience of discussion, we will consider only CP phases, neglecting vP phases in the rest of this paper. If *who* in (37) remains in-situ without moving to CP-Spec at the end of the embedded CP phase, the external probe (here an edge feature [EF] in the head of the matrix CP) cannot attract *who*, because *who* is within the domain of the embedded phase head C.[13]

(39) a. [$_{CP1}$ Who does [$_{TP1}$ Bill think [$_{CP2}$ Ø $_C$ [$_{TP2}$ ~~who~~ saw John]]]]?
                                          ⇓ transfer
     b. [$_{CP1}$ Who does [$_{TP1}$ Bill think [$_{CP2}$ ~~who~~ Ø $_C$ [$_{TP2}$ ~~who~~ saw John]]]]?
                                          ⇓ transfer

In other words, at the end of the embedded CP phase, the domain of the embedded phase head C (that is, the underlined part) will undergo transfer as in (39a), and will not be accessible to any further syntactic operation. After all, *who* is frozen in place, and cannot move any further. This is the reason wh-movements apply in a successive-cyclic fashion. If *who* moves to CP2-Spec at the end of the embedded CP phase as in (39b), *who* is outside of the domain of the embedded phase head C, and thus can move to CP1-Spec attracted by the edge feature of the matrix phase head C. If Chomsky's PIC is correct, the proposal that subject wh-phrases remain in-situ in case of a null complementizer cannot be accepted.

If the embedded clause is TP, not CP when there is no overt complementizer, as some scholars (cf. Bošković (1997), Doherty (1997), and Ishii (2004)) suggested, it is possible for the embedded interrogative subject to move directly to the matrix CP without violating the PIC. As Erlewine (2017) points out, however, the following sentence

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[12] A transitive vP is a phase, but an intransitive vP is not. Chomsky (2001) indicates this distinction by calling the former v*P and the latter vP. According to this distinction only v*P is a phase. In this paper, however, this distinction is neglected, because it is not relevant to the main goal of the paper.

[13] It is assumed that C has an edge feature, which triggers movement of the closest wh-phrase to become the SPEC of CP. Since the edge feature is uninterpretable, it must be deleted. The only way of deleting the feature is assumed to be filling the SPEC of CP with a wh-phrase via movement or merge.

shows that even in the case of no overt complementizer, the embedded clause is CP, because the embedded wh-phrase has to move to CP-Spec.

(40) Which picture of himself₍ᵢ₎ did Mary tell John₍ᵢ₎ [she would buy ___]]?

In (40), in order for *himself* to be bound by *John*, the wh-phrase *which picture of himself* has to move to the edge position of the embedded clause, which is regarded as CP-Spec.

Moreover, the following examples from Irish English further illustrate that interrogative wh-phrases have to move to the initial position of the embedded clause even when there is no overt complementizer.

(41) a. <u>What all</u> do you think he'll say we should buy?
     b. <u>What</u> do you think <u>all</u> he'll say we should buy?
     c. <u>What</u> do you think he'll say <u>all</u> we should buy?
     d. <u>What</u> do you think he'll say we should buy <u>all</u>? (McCloskey 2000:62)

Conclusively speaking, the embedded clause is CP even if there is no overt complementizer. As long as the embedded C has an [EF], all the wh-phrases including the interrogative subject have to move to CP-Spec.

There is another piece of argument for the embedded subject movement to CP. Let us consider the following examples.

(42) a. I wonder [꜀ₚ what Ø [+Q] [ₜₚ John broke ~~what~~]].
                        [~~EF~~]
     b. *I wonder [꜀ₚ that[-Q] [ₜₚ John broke the window]].

The verb *wonder* selects a complement (=CP) whose head has an interrogative [+Q] feature. This selectional requirement is not satisfied in (42b) because the complement head does not have a [+Q] feature, and thus results in ungrammaticality. It is assumed that the complementizer with [+Q] has an [EF] (or the EPP property), which must be deleted because it is uninterpretable. The deletion of the edge feature is done only by the SPEC position being occupied by a wh-phrase (deletion being indicated by ~~strikethrough~~). This is the reason *what* moves to the embedded CP-Spec in (42a). Now consider the case of the subject wh-phrase.

(43) a. I wonder [꜀ₚ Ø [+Q][EF] [ₜₚ who broke the window]].
     b. I wonder [꜀ₚ who Ø [+Q][~~EF~~] [ₜₚ ~~who~~ broke the window]].

The head of the embedded CP has an edge feature. If the interrogative subject does not move to CP-Spec as in (43a), the [EF] cannot be deleted. Conclusively it is inevitable for the interrogative subject to move to CP-Spec as in (43b). If the [EF] in (43a) can be deleted by means of some kind of AGREE without CP-Spec being filled, the [EF] in (42a) will be able to be deleted as well without CP-Spec being filled. But it is not possible. On the basis of these considerations it is concluded that the analysis of *that*-trace effects based on anti-locality (that is, SSAL) cannot be accepted.

3. Movement of Interrogative Subjects

As mentioned in the previous section, if a matrix wh-subject moves to CP, it will violate anti-locality (i.e. SSAL). In order to solve this problem, Brillman and Hirsch (2016) argue on the basis of the following examples that matrix interrogative subjects remain in TP-Spec, not moving to CP-Spec, which is referred to as the Vacuous Movement Hypothesis (VMH).[14]

First, *do*-support is prohibited in subject questions, but required in non-subject questions.

(44) a. Who saw John?
    b. *Who did __ see John?
(45) a. *Who John saw __?
    b. Who did John see __?

Second, parasitic gaps (pgs) are licensed only in non-subject questions, not licensed in subject questions (cf. Engdahl (1983)).

(46) a. *Who __ hired Mary [without her talking to __$_{pg}$]? (subject)
    b. Who did Mary hire __ [without talking to __$_{pg}$]? (object)

Brillman and Hirsch (2016) argue that these phenomena can be naturally accounted for under the VMH. That is, English is a residual V2 language, where wh-movement to CP-Spec in matrix clauses is typically accompanied by T-to-C movement. If *who* in (44) does not move to CP-Spec, it is not surprising that T-to-C movement is not triggered. Since A'-movement is required for the licensing of a parasitic gap (cf, Nissenbaum (2000)), no movement of *who* results in the ungrammaticality of (46a).

However, the VMH involves a lot of problems. First, if the assumption that an interrogative C has an edge feature is correct,[15] the feature cannot be deleted without movement of the interrogative subject. As mentioned in section 2, an edge feature can be deleted only by the SPEC of a head with the feature being filled by some overt element. Given the VMH the edge feature of C cannot be deleted.[16]

It can be argued that a certain feature (for instance, an edge feature) can be checked via AGREE without movement. An immediate question that arises in this context is why checking via AGREE is not possible in the case of object questions.

(47) a. [$_{CP}$ C[~~EF~~] [$_{TP}$ who has done it]]?
    b. *[$_{CP}$ C[EF] [$_{TP}$ he has done what]]?

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[14] Ishii (2004) suggests an analysis based on the VMH for *that*-trace constructions.

[15] The edge feature on an interrogative C will need to attract an interrogative expression to move to CP-Spec in order for the relevant clause to be interpreted as interrogative (Refer to Radford (2009) for conference.).

[16] It implies that not only wh-questions but also yes-no questions are CPs with an interrogative specifier. Radford (2009:163) suggests that "yes-no questions contain a null yes-no question particle which is directly generated in spec-C." The suggestion is plausible from a historical perspective since Elizabethan English had main-clause yes-no questions introduced by *whether*.
  (i) Whether had you rather lead mine eyes or eye you master's heels?
  (ii) Whether dost thou profess thyself a knave or a fool?

(47b) is ungrammatical even though checking without movement is done in the same fashion as in subject questions.

Second, the following Irish English examples work against the VMH.

(48) <u>Who</u> was throwing stones <u>all</u> around Butchers' Gate?

(49) *<u>They</u> were throwing stones <u>all</u> around Butchers' Gate. (McCloskey 2000:77)

An immediate question that arises here is "what is the position the interrogative subject *who* occupies, CP-Spec or TP-Spec?" What is clear from the contrast between (48) and (49) is that *who* is in CP-Spec. If *who* is in TP-Spec, the contrast would be indistinguishable. According to McCloskey, (49) is ruled out due to improper movement of *they* from an A'-position to an A-position. (For the more specific explanation for this movement, consult McCloskey (2000). If *who* in (48) moves to TP-Spec in the same fashion, this movement will be improper as well, resulting in ungrammaticality. This problem is avoided by the direct movement of *who* to CP-Spec when C is introduced.[17] (Of course this movement is not a piece of evidence against anti-locality, because *who* moves to CP-Spec from within vP, not from TP-Spec.) This is the reason (48) is accepted. Whatever the proper explanation for the contrast may be, the crucial point is that interrogative subjects have to move to CP-Spec. As long as the subject wh-phrase remains in-situ, there is no way to explain the contrast.

Third, if interrogative subjects do not move to CP-Spec, the following sentence (50a) will be predicted to be grammatical, contrary to fact.

(50) a. *What might he think who has done?

b. [$_{CP}$ what might [$_{TP}$ he think [$_{CP}$ ~~what~~ [$_{TP}$ who has done ~~what~~]]]]

(50b) indicates the representation where *who* is in-situ. Since *who* does not move to CP-Spec, the embedded clause is not a wh-island, and cyclic movement through the embedded CP-Spec of *what* as in (50b) will be allowed. The movement like this must not be allowed, however, because the sentence is not grammatical.[18]

Moreover, Chomsky (2008) proposes a new approach about interrogative subject movements.

(51) a. Who saw John?

b. [C [T [$_{vP}$ who [$_{VP}$ see John]]]]

c. [$_{CP}$ who$_i$ C [$_{TP}$ ~~who~~$_j$ T [$_{vP}$ ~~who~~$_k$ [$_{VP}$ see John]]]]

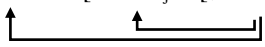d. [$_{CP}$ who$_i$ C [$_{TP}$ ~~who~~$_j$ T [$_{vP}$ ~~who~~$_k$ [$_{VP}$ see John]]]]

If T and C are merged at the end of vP phase, the structure like (51b) is derived. Chomsky (2008) suggests, in order to avoid non-uniform chains, that the derivation proceeds like (51d), not like (51c). That is, the agreement

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[17] This direct movement is problematic in that the EPP of T is not satisfied because TP-Spec is not occupied. One way of overcoming this problem is to resort to parallel movement suggested by Chomsky (2008). The mechanism of parallel movement will be specified later.

[18] The ungrammaticality of (50) can be accounted for by the Superiority Condition, which defines that an operation is done with an element in a higher position rather than one in a lower position. If the Superiority Condition works in the embedded clause in (50), *who* must move to CP-Spec.

feature that T inherits from C raises *who* to TP-Spec, and the edge feature of C raises *who* to CP-Spec. All the other copies of *who* except for the one in the highest position are not pronounced. After all, there is a direct relation between who_i and who_k, and between who_j and who_k, but there is no direct relation between who_i and who_j. If this kind of parallel movement is correct, there is no direct movement from TP-Spec to CP-Spec. So subject movement to CP-Spec does not violate the SSAL. However, the argument that interrogative subjects move to CP-Spec is still valid.

   If this kind of parallel movement is accepted, *that*-trace effects will not take place, because there is no movement violating anti-locality (the SSAL), as the following derivation illustrates.

   (52) a. *Who do you think that saw John?
        b. Who do you think [CP ~~who~~$_i$ that [TP ~~who~~$_j$ T [vP ~~who~~$_k$ [VP see John]]]]

(52b) shows no violation of the SSAL, because *who* does not move to CP-Spec from TP-Spec. Nevertheless, the *that*-trace effect is not obviated. This leads us to conclude that any approach to account for *that*-trace effects on the basis of anti-locality is problematic. These considerations imply that wh-subjects move to CP-Spec, not remaining in-situ, whatever analysis is adopted for their movement.

   Now let's go back to the discussion of parasitic gap (pg) constructions mentioned in Brillman and Hirsch (2016). For convenience of discussion the examples of (46) are repeated here as (53).

   (53) a. *Who __ hired Mary [without her talking to __pg]? (subject)
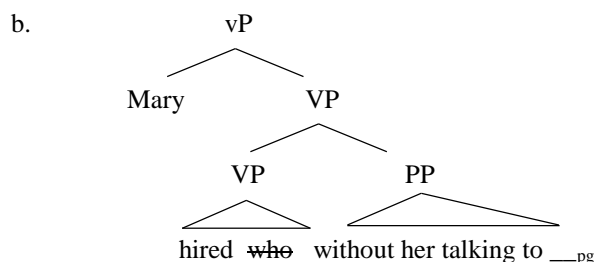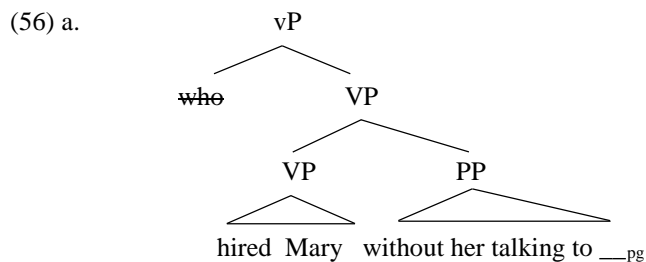   b. Who did Mary hire __ [without talking to __pg]? (object)

How can the contrast in (53) be accounted for? The examples from Engdahl (1983:20) illustrate that all interrogative subjects do not license a pg.

   (54) a. *Which articles __ got filed by John without him reading __pg?
        b. *Who __ sent a picture of __pg?
        c. *Who __ remembered talking to __pg?

If questioned matrix subjects do not move, and consequently don't leave gaps, as Brillman and Hirsch (2016) argue, the subject-object asymmetry can be accounted for by whether overt movement takes place or not. That is, only interrogative objects moving overtly license a pg. The explanation does not work, however. Even when there is an overt wh-movement like (55), which questions a subject even though it is non-matrix, the pg construction is still not possible.

   (55) *Which articles did you say __ got filed by John without him reading __pg?

After all, the subject-object asymmetry in pg constructions has to be rather accounted for by a difference in c-command relation between a real gap and a pg, as Engdahl (1983) suggests. Consider this difference in structure. The structures (a partial relevant structure only) of (53a) and (53b) would be like (56a) and (56b) respectively.

(56) a.

```
                    vP
                  /    \
               w̶h̶o̶     VP
                     /      \
                   VP        PP
                  /  \      /    \
              hired  Mary  without her talking to __pg
```

b.

```
                    vP
                  /    \
               Mary     VP
                     /      \
                   VP        PP
                  /  \      /    \
              hired  w̶h̶o̶  without her talking to __pg
```

There is a restriction between a real gap and a pg that the former not c-command the latter. In (56a) w̶h̶o̶ (the real gap) c-commands the pg whereas in (56b) w̶h̶o̶ does not. This is the reason only a real object gap licenses a pg.

However, the restriction in pg constructions cannot be dubbed a subject-object asymmetry. There are cases where even a real subject gap licenses a pg like the following.

(57) Which Caesar did Brutus imply __was no good while ostensibly praising __pg?

(55) and (57) differ with respect to the structural relation between a real gap and a pg. This difference is shown in the following bracketed representation (adapted from Engdahl 1983:21).

(58) a. *Which articles did you say [CP __ got filed by John [without him reading __pg]]?
     b. Which Caesar did Brutus imply [CP __was no good] [while ostensibly praising __pg]?

In (58a) the real subject gap c-commands everything within the embedded clause including the adjunct phrase containing the pg. In (58b), on the other hand, the real gap does not c-command the pg because the *while* clause is outside the embedded clause. After all, the contrast in (53) can be naturally accounted for via the c-command restriction between the real gap and the pg without the VMH.

To summarize, interrogative subjects move to CP-Spec, even though the movement does not constitute the evidence against anti-locality, if we accept Chomsky's (2008) proposal that movement of interrogative subjects is not a direct short movement from TP to CP.

4. *That*-Trace Effects Revisited

Now that *that*-trace effects cannot be accounted for via anti-locality based on the SSAL, we go back to the starting point of this paper: What do *that*-trace effects come from? The effects include a broader set of phenomena, as the following examples show (Recited from Pesetsky (2017)).

(59) *That*-trace effect with all types of Ā-movement

    a. This is the person who I thought (*that) met Sue. (relativization)

    b. Mary we think (*that) __ met Sue. (topicalization)

    c. It is Mary that we think (*that) __ met Sue. (cleft)

    d. More people like Mahler than we think (*that) __ like Bruckner. (comparative)

    e. ?Bill will be easy for us to say (*that) __ met Sue. (*tough*-movement)

Moreover, complementizer *for* shows the same effects as those triggered by *that*.

(60) a. Who would you prefer (for) Sue to meet __ at the station?

    b. Who would you prefer (*for) __ to meet Sue at the station?

So this broader set of phenomena has been called complementizer-trace (Comp-trace) effects, one of which is *that*-trace effects.

Chomsky and Lasnik (1977) suggested that Comp-trace effects come from a principle of Universal Grammar (UG). Their suggestion is based on two factors. One is the argument of Poverty of the Stimulus. That is, the effect is acquired by children even in the absence of relevant input data. The other is that the effect is observed in many languages cross-linguistically.[19] So a lot of scholars have tried to account for the effect systematically. Those accounts can be roughly classified into two groups. One is linear accounts, and the other is structure-based accounts. The *that*-trace filter suggested by Chomsky and Lasnik (1977) is a typical example of the linear accounts. The linear accounts have a crucial disadvantage in that they single out a particular string which is judged unacceptable. On the other hand the structure-based accounts have tried to explain Comp-trace effects by means of a structural property. ECP (Empty Category Principle) based approaches, such as those of Kayne (1981), and Lasnik and Saito (1984) have been the main stream of the structure-based accounts for a long time. The account in terms of anti-locality presented in this paper is an alternative in the structure-based accounts. In addition to these accounts, there are minor alternatives, like the Nominative Island Condition account suggested by Pesetsky (1982), and the feature-based account suggested by Pesetsky and Torrego (2001). All these accounts are far from being complete because there are many counter-examples which they cannot apply to.

All structure-based accounts suggest that the Comp-trace phenomena have their roots in UG, and put a focus on finding a systematic principle deriving the phenomena. However, Comp-trace phenomena in English shows significant variation among speakers. Pesetsky (1982:328) reports that some African American speakers may allow *that*-trace constructions. Sobin (1987) reports that native English speakers in Iowa and Illinois may allow *that*-trace constructions. Sobin (2002) reports an extensive investigation results about the acceptability of *that*-trace constructions. Many subjects of native speakers show much variation in acceptability. If *that*-trace effects come from a certain universal principle, there will not be such a significant variation in acceptability. Considering these variations, it appears that Comp-trace effects are attributed to a certain condition rather than to a principle.

Another problem that we have to mention is that these accounts do not cover anti-*that*-trace effects, which specifies that in (61b) *that* (or a relative pronoun) must be present.

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[19] For a detailed explanation and examples, see Pesetsky (2017).

(61) a. I met the woman that __ saw John.
     b. *I met the woman __ saw John.

The judgements in relative clauses shown in (61) are the exact opposite of what most accounts for the *that*-trace effect predict.[20] It is too far beyond the scope of this paper to suggest a comprehensive analysis to solve all the problems above mentioned including anti-*that*-trace effects. We hope such a comprehensive analysis will be prepared in near future. It is notable that Comp-trace effects remain a puzzle.

5. Conclusion

This paper has considered if anti-locality defined by the SSAL really works well in accounting *that*-trace effects. It has been illustrated that there are many pieces of conceptual and empirical evidence against the SSAL. Accordingly, the account for *that*-trace effects based on the SSAL cannot be accepted. What is crucial in alleviating *that*-trace effects is the property of intervening elements between CP and TP, not just the SSAL.

These considerations are enough to reject the account of *that*-trace effects based on anti-locality (the SSAL), even though a comprehensive account covering all the examples regarding the adverb effect, topic islands, and fronted focus elements has not been suggested. We are looking forward to an analysis attributing a difference in the property of intervening elements between CP and TP to a structural difference based on a refined CP structure.

Moreover, the considerations lead us to the starting point: what do *that*-trace effects come from? Daring not attempt to solve all the problems concerning *that*-trace effects, we only note that the effects remain a puzzle, admitting that there is a significant variation in acceptability of *that*-trace constructions. We are satisfied only with summarizing major accounts for *that*-trace effects briefly.

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[20] Douglas (2017) proposes a unified analysis of *that*-trace and anti-*that*-trace effects, using the SSAL suggested by Erlewine (2014, 1017). The analysis is problematic, however, in that it is based on a stipulation that ForceP-Spec can be a final but not an intermediate landing site. For a detailed explanation, see Douglas (2017).

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Examples in: English
Applicable Languages: English
Applicable Level: All