

On the Validity of the ECP Account of the *That-Trace* Effect and Consequences of the PolP Hypothesis\*

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1. Introduction

In this article I will argue against the suggestion made by Culicover (1993), who says that the Empty Category Principle (henceforth ECP) account of the *that-trace* (henceforth *that-t*) effect is problematic and that it should be abandoned;<sup>1</sup> instead he suggests that the *that-t* filter originally proposed by Chomsky and Lasnik (henceforth C&L) (1977) can better capture the basic facts of the presence and the absence of the *that-t* effect. Let us consider the following sentences provided by Culicover (1993:557-558), where the *that-t* effect is suspended if an adverbial phrase intervenes between *that* and the trace:

- (1) a. Robin met the man  $\{Op_1 \text{ that/who}_1\}$  Leslie said that *for all intents and purposes*  $t_1$  was the mayor of the city.  
b. \*Robin met the man  $\{Op_1 \text{ that/who}_1\}$  Leslie said that  $t_1$  was the mayor of the city.
- (2) a. This is the tree  $Op_1$  that I said that *just yesterday*  $t_1$  had resisted my shovel.  
b. \*This is the tree  $Op_1$  that I said that  $t_1$  had resisted my shovel.
- (3) a. I asked  $what_1$  Leslie said that *in her opinion*  $t_1$  had made Robin give a book to Lee.  
b. \*I asked  $what_1$  Leslie said that  $t_1$  had made Robin give a book to Lee.

Notice that the above data are compatible with the following surface filter presented by C&L (1977:451):<sup>2</sup>

- (4) \* $[_s \text{ that } [_{NP} e] \dots]$ , unless  $S'$  or its trace is in the context:  
     $[_{NP} \_ \dots]$

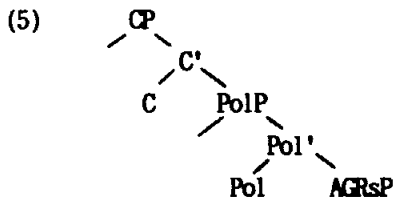
This filter correctly excludes the output in which the complementizer *that* is adjacent to a phonologically null element (i.e. a *wh*-trace). Thus, as the sentences in (1)-(3) indicate, if the complementizer *that* is adjacent to the trace of a *wh*-element or an empty operator, the sentence is ill-formed because of a violation of the surface filter in (4). On the other hand, if an adverbial phrase such as *just yesterday* intervenes between *that* and the trace, the output does not violate (4) and thus well-formed sentences are obtained. However, in what follows, I will show a piece of empirical evidence against the "surface filter account" of the *that-t* effect and provide an alternative analysis, arguing for the ECP account of the *that-t* effect.

This paper is organized as follows. In section 2 I review Culicover (1993) and go over his claim in detail. I conclude that the apparent problematic cases of the ECP account of the *that-t* effect which Culicover (1993) points out are not really crucial matters. I claim that the problematic cases for the ECP account are excluded in terms of the notion of "Economy" by Chomsky (1991; 1993). I also provide a piece of data showing an inadequacy of the "surface filter account", which involves the interaction between extraction of embedded subject and embedded topicalization. In section 3 I attempt to explain the suspension of the *that-t* effect on the basis of the existence of the Polarity Phrase (henceforth PolP). Some concluding remarks are made in section 4.

## 2. The PolP Hypothesis and Suspension of *That-t* Effects

### 2.1. Two Arguments for Abandoning the ECP Account

Culicover (1991) argues that the absence of the *that-t* effect provides good support for the existence of PolP which is positioned between CP and AGRsP as indicated in (5):



The existence of the functional category between CP and AGRsP is confirmed by the following sentence with embedded negative preposing:

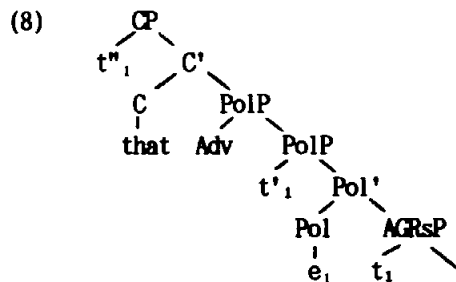
- (6) I said that under no circumstances *would* John run for any public office.

Notice that in (6) the auxiliary verb *would* is preposed across the subject NP *John*. It has been argued in some literature that this "Subject-Aux Inversion" (SAI) is obligatory in the case of negative preposing. Therefore, if inversion does not take place, the sentence is ill-formed:

- (7) \*I said that under no circumstances John would run for any public office.

If the general assumption that head movement must be structure-preserving (cf. Chomsky 1986) is correct, it seems natural to posit the functional head to which the auxiliary verb *would* is allowed to move in the context of negative preposing. Let us call this the "PolP hypothesis".

Now let us consider how the absence of *that-t* effects can be captured by the PolP hypothesis in Culicover's (1991) analysis. He assumes that the structure of sentences such as (1)-(3), where an adverbial phrase intervenes between the complementizer *that* and the subject trace, is represented as follows:



Notice here that an intervening adverb is assumed to be adjoined to PolP.<sup>3</sup> Thus, in the case of extraction, the *wh*-phrase in subject position can move to the Spec of PolP, inducing Spec-head agreement between the subject *wh*-phrase

and the empty Pol head. I assume here that non-pronominal empty categories must be licensed by the following general principle:

- (9) ECP: A non-pronominal empty category must be properly governed by a head coindexed with it.<sup>4</sup>

Given (9), the empty head Pol in (8) coindexed with the subject trace by Spec-head agreement properly head governs the original subject trace, satisfying the ECP. This indicates that the ECP account of the *that-t* effect seems to be strongly supported to the extent that the PolP hypothesis is plausible.

However, Culicover (1993) abandons his 1991 analysis for the following two reasons. First, consider sentence (5) again, which involves negative preposing and SAI:

- (5) I said that under no circumstances would John run for any public office.

Even though embedded subject extraction is applied to (5), the sentence is still well-formed:

- (10) Who<sub>i</sub> did you say that under no circumstances would t<sub>i</sub> run for any public office?

Culicover (1993) says that the configuration of sentence (10) is similar to that of the following ungrammatical sentence in (11). This is a so-called main clause ECP effect (Koopman 1983):

- (11) \*Who did leave early?

If *did* is omitted, the sentence becomes well-formed:

- (12) Who left early?

The relevant configuration of (11) seems to be the following:

(13) [<sub>CP</sub> Who<sub>i</sub> [<sub>C</sub> did<sub>i</sub> [<sub>AGR,IP</sub> t<sub>i</sub> ...

In (13) it appears that Spec-head agreement relation is established between *who* in the Spec of CP and the head *did* in the C<sup>0</sup>, and thus the sentence would be predicted to be grammatical because the original subject trace is properly governed by the head C<sup>0</sup> coindexed with it, contrary to fact. The ungrammaticality of (11) leads Rizzi (1990) to claim that the overt head in C<sup>0</sup> is inert for head-government. Rizzi claims that an overt element in C<sup>0</sup> is some kind of complementizer, whereas a covert head in the C<sup>0</sup> is realized as Agr. Rizzi further claims that only Agr can induce Spec-head agreement and then it turns out to be a proper head governor. Extending this proposal to the head of PolP, Culicover (1993) claims that the well-formedness of (10) is a surprising fact, since the Pol<sup>0</sup> is occupied by the overt element *would* and thus it is inert with respect to agreement. Therefore, he concludes that in (10) the Spec-head agreement in PolP cannot occur and the sentence would be wrongly predicted to be ungrammatical.

Secondly, consider the status of the intermediate trace in (8). The question is whether intermediate traces in the Spec of PolP in sentences such as (1)-(3) are subject to the ECP. Let us assume that the distribution of intermediate traces is constrained by the ECP, because they are also non-pronominal empty categories. Under this assumption, the well-formedness of sentences with intervening adverbs such as (1)-(3) indicates that intermediate traces may be either properly governed or deleted at LF before the EGP applies (cf. Lasnik and Saito (henceforth L&S) 1984). Culicover argues that if the former idea were correct, we would falsely predict that there is no *that-t* effect in the following sentence:

(14) \*Who<sub>i</sub> do you think that t<sub>i</sub> left early?

He assumes that the relevant representation of (14) is the following, where the projection of the head Pol is involved even though there is no intervening adverb between the complementizer and the subject trace:

(15) ... [<sub>CP</sub> [<sub>S,...</sub> NP<sub>i</sub>] that [<sub>PolP</sub> [<sub>S,...</sub> t'<sub>i</sub>] [[<sub>Pol</sub> e<sub>i</sub>] [<sub>AGR,IP</sub> t<sub>i</sub>...]]]]

In (15) the original trace can be properly governed by the empty head Pol<sup>0</sup> coindexed with the intermediate trace in the Spec of PolP. If the intermediate trace in the PolP Spec were properly governed, it could also be licensed, and no violation would take place.

On the other hand, let us suppose that intermediate traces cannot be properly governed and that they may be deleted at LF. This case also raises the same problem. Although the offending trace can be deleted and the sentence does not yield an ECP violation in such sentences involving intervening adverbs as (1)-(3), the same process holds of (15). That is, since the offending trace in (15), which is irrelevant to any semantic interpretations, can be deleted at LF, it does not violate the ECP, yielding a well-formed sentence. Therefore, Culicover (1993) concludes that the PolP hypothesis does not straightforwardly explain the absence of the *that-t* effect; on the contrary, it induces a wrong prediction. This conclusion thus leads him to claim that the ECP account of the *that-t* effect is not on the right track, suggesting that the "surface filter account" can correctly cover the basic facts.

## 2.2. On the Notion of "Economy"

I will propose here that the two problematic cases of the ECP account on the basis of the PolP hypothesis are not really problems on the assumption that there exists another principle other than the ECP, which excludes the sentences in question, that is, the principle of "Economy", and I will suggest that the ECP account of the *that-t* effect is still on the right track.

I assume, following Chomsky (1991), that the principle of Economy is divided into two parts, namely, Economy of Derivation and Economy of Representation. In this subsection I will focus on the former principle and argue that the main clause ECP effect is excluded by the principle of Economy of Derivation, suggesting, contrary to Rizzi (1990), that all kinds of heads are potential proper head governors. This indicates that the suspension of the *that-t* effect in the sentence with negative preposing is not a problem for the ECP account. On the other hand, Economy of Representation is relevant to another problem for the status of intermediate traces. This is a matter to be considered in section 3.

### 2.2.1. The Spec of AGRsP as a Dual Function of A/A-Bar Position

Diesing (1990) argues that in Yiddish the Spec of AGRsP (in her term IP) has a dual function with respect to A/A-bar distinction. First of all, consider the following sentences, about which Diesing points out that, unlike most Germanic languages, Yiddish shows topicalization and Verb Second (V2) in both main and embedded clauses:

- (16) a. *Dos bukh hot Max geleyent*  
 the book has Max read  
 'Max read the book.'
- b. *Ir zolt visn zayn, mayne libe kinderlekh, az vayn ken men*  
 You should know be my dear children that wine can one  
*makhn fun troybn oykh.*  
 make from grapes also  
 'You should know, my dear children, that one can make wine from grapes also.'

It has been generally assumed that in V2 languages verbs move to C<sup>0</sup> if any phrase moves to the Spec of CP. Thus, the problem is that in (16b) V2 takes place regardless of the fact that the embedded head C<sup>0</sup> is occupied by the overt complementizer *az*. This contrasts with the following German sentences:

- (17) a. *Das Buch hat die Frau gelesen.*  
 the book has the woman read  
 'The woman has read the book.'
- b. *Ich glaube, dass die Frau das Buch gelesen hat.*  
 I believe that the woman the book read has  
 'I believe that the woman has read the book.'

Diesing (1990) claims that this contrast can be explained straightforwardly if in Yiddish finite verbs move not to C<sup>0</sup> but to Infl. Assume that this is correct. Then, this assumption suggests that in (16a) the topic phrase *Dos bukh* 'the book' need not be in the Spec of CP. Rather, it is possible to say that it moves to the Spec of AGRsP. If it is the case, a natural question

arises: what is the nature of the Spec of AGRsP? It has been generally assumed that the Spec of AGRsP can function as an A-position, which is defined as a potential  $\theta$ -position, a position assigned some  $\theta$ -role. However, Diesing proposes that the Spec of AGRsP can function as a landing site for either A-movement or A-bar movement. More specifically, in the case of subject raising, it appears to function as a landing site for NP-movement, whereas it functions as an operator position when a non-subject is raised. The assumption that the Spec of AGRsP functions as an A-bar position is supported by the following examples, where both *wh*-movement and topicalization cooccur:

- (18) a. \*Ver dos broyt hot gegesn?  
           who the bread has eaten  
       b. \*Ver haynt hot gegesn dos broyt?  
           who today has eaten the bread

The ungrammaticality of (18) can be straightforwardly accounted for by the assumption that *wh*-movement also involves movement to the Spec of AGRsP, which functions as an operator position. These are in contrast with embedded *wh*-questions involving topicalization:

- (19) a. Ikh veys vos *bay mir* tut zikh.  
           I know what by me does REFL  
           'I know what goes on with me.'  
       b. Zi iz gekumen zen ver *frier* vet kontshen.  
           she is come see who earlier would finish  
           'She has come to see who would finish earlier.'

Notice that in (19) the head  $C^0$  is selected by verbs bearing a [+WH] feature. Since  $C^0$  comes to bear the [+WH] feature under the head-head relation, *wh*-movement to the Spec of CP must occur in embedded questions. Thus, *wh*-movement and topicalization need not compete for the same preverbal position, that is, the Spec of AGRsP. Therefore, Diesing concludes that the Spec of AGRsP has a dual function as A/A-bar position in Yiddish. Moreover, this phenomenon is not restricted to only Yiddish. Consider the following sentence, where Goodall (1992), citing Finer's data from Selayarese, claims that the Spec of AGRsP



functions as A/A-bar position:

- (20) *ku-isse?-i kuko inai mu-pau la-keo Ali*  
 is know-3 comp who 2fam-say 3-call Ali  
 'I know who you said Ali called.'

In (20) the *wh*-phrase *inai* 'who' is to the right of the  $C^0$  *kuko*. It seems reasonable to say that it occupies the Spec of AGRsP. Therefore, I assume the following statement to be plausible:

- (21) The Spec of AGRsP has a dual function as A/A-bar position.<sup>5</sup>

I further assume as a null hypothesis that (21) universally applies to every language. That is, (21) also holds of English. This means that the representation of sentence (22a) involving a matrix *wh*-question of subject is not (22b) but (22c):

- (22) a. Who left early?  
 b. [<sub>CP</sub> Who<sub>i</sub> [<sub>C</sub> C<sup>0</sup> [<sub>AGR<sub>S</sub>P</sub> t<sub>i</sub> [<sub>AGR<sub>S</sub></sub> AGR<sup>0</sup> [<sub>VP</sub> left early]]]]]]  
 c. [<sub>AGR<sub>S</sub>P</sub> Who [<sub>AGR<sub>S</sub></sub> AGR<sup>0</sup> [<sub>VP</sub> left early]]]

In (22c), the *wh*-element *who* remains in-situ and it is in a Spec-head relation with the head AGR<sup>0</sup>. On the other hand, (22b) shows that the *wh*-phrase *who* moves to the Spec of CP and that Spec-head agreement takes place between the *wh*-element and the empty head in C<sup>0</sup> on the assumption that the empty head C<sup>0</sup> can be involved in a Spec-head relation. The fact that the representation in (22b) is inappropriate seems to be indirectly supported by the following ungrammatical sentence and its representation:

- (23) a. \*What John bought?  
 b. [<sub>CP</sub> What<sub>i</sub> [<sub>C</sub> C<sup>0</sup> [<sub>AGR<sub>S</sub>P</sub> John [<sub>AGR<sub>S</sub></sub> AGR<sup>0</sup> [<sub>VP</sub> bought t<sub>i</sub>]]]]]]

If (22b) were a correct representation of (22a), the ungrammaticality of (23a) would remain mysterious: since the empty head C<sup>0</sup> is assumed to be in a Spec-head relation in (22b), the same must be true in the case of (23b), which

would yield a well-formed sentence, contrary to fact. Thus, the ungrammaticality of (23a) suggests that the empty element in  $C^0$  in matrix clauses cannot be an appropriate head with respect to a Spec-head relation for some unknown reason.<sup>6</sup> If *do*-support takes place, the sentence becomes well-formed:

(24) What did John buy?

Thus, it seems to be reasonable to say that the representation of (22a) is (22c), not (22b), due to the empirical fact that the empty head in  $C^0$  in matrix clauses is inert with respect to Spec-head agreement.

Furthermore, we are forced to hypothesize (25) for the above proposal to work out:

(25) A [+WH] feature in the Spec of AGRsP must be checked off by the head AGRs<sup>0</sup> which can bear a [+WH] feature.

Under the "Minimalist approach" by Chomsky (1993), a *wh*-element must move to a Spec position in order for its strong [+WH] feature to be checked off by an appropriate functional head, otherwise, the derivation would "crash". Thus, if a *wh*-element remains in-situ at Overt Syntax, its [+WH] feature must be checked off by AGRs<sup>0</sup>.

Given that (21) is correct, let us now turn to the following sentence involving the main clause ECP effect, repeated here as (26):

(26) \*Who did leave early?

Recall here that the auxiliary verb *did* appears in the head of CP as in the case of sentences such as *who did John see?* It thus follows that the interrogative pronoun *who* moves to the Spec of CP. I propose that the ungrammaticality of (26) is due to a violation of Economy. That is, the derivation of (26) violates the "last resort" principle: since a *wh*-element can be checked in the Spec of AGRsP, the further movement of *who* to the Spec of CP involves a superfluous step, yielding a violation of Economy of Derivation.<sup>7</sup> The principle of Economy of Derivation is stated as follows:

## (27) Economy of Derivation:

No superfluous step is involved in a derivation of a sentence.

Therefore, we can say that one problematic case for the ECP analysis of the *that-t* effect is independently ruled out by the principle of Economy of Derivation.<sup>8</sup>

## 2.2.2. Short-Distance Scrambling in Japanese and A/A-Bar Distinction

The assumption in (21) has another consequence for Japanese scrambling. First of all, consider sentence (28b) involving "short-distance" scrambling:

- (28) a. \**[otagai<sub>1</sub>-no sensei]-ga karera-o<sub>1</sub> hihansi-ta*  
           each other-GEN teacher-NOM they-ACC criticize-PAST  
           'Each other's<sub>1</sub> teachers criticized them<sub>1</sub>'  
       b. *karera-o<sub>1</sub> [otagai<sub>1</sub>-no sensei]-ga t<sub>1</sub> hihansi-ta*

Saito (1992) argues that short-distance scrambling in Japanese is ambiguous with respect to A/A-bar distinction. In (28a), the anaphor *otagai* 'each other' is not c-commanded by its antecedent *karera* 'they' and the sentence results in a violation of Binding Condition A, which roughly says that an anaphor must be c-commanded by its antecedent in an A-position within some local domain. On the other hand, in (28b), where the antecedent of the anaphor is preposed to the sentence-initial position, it obviously c-commands the anaphor. Furthermore, the grammaticality of (28b) indicates that the scrambled element is in an A-position, otherwise Binding Condition A would not be satisfied. From this fact, it is natural to say that short-distance scrambling in Japanese exhibits a characteristic of A-movement.

Next, let us turn to the following examples:

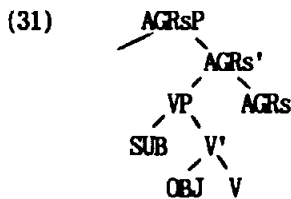
- (29) a. *John-ga<sub>1</sub> zibunzisin-o<sub>1</sub> hihansi-ta*  
           -NOM self -ACC criticize-PAST  
           'John criticized himself'  
       b. *zibunzisin-o<sub>1</sub> John-ga<sub>1</sub> t<sub>1</sub> hihansi-ta*

Notice that in (29b) the anaphor *zibunzisin* 'self', which is coindexed with *John*, also undergoes short-distance scrambling. If it were in an A-position like (28b), it would violate Binding Condition C, which prohibits some element in an A-position from c-commanding a referential NP as its antecedent. Thus, the grammaticality of (29b) suggests that *zibunzisin* 'self' is in an A-bar position. This is confirmed by the following English counterpart:

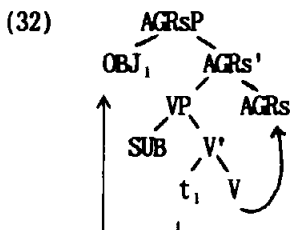
(30) *Himself*<sub>1</sub>, *John*<sub>1</sub> criticized.

In (30) *himself* c-commands, and is coindexed with, *John*, but *himself*, which undergoes topicalization, is in an A-bar position, resulting in no violation of Binding Condition C. Thus, as Saito (1992) argues, it is obvious that short-distance scrambling exhibits a property of both A and A-bar movement.

These peculiar properties of short-distance scrambling can be straightforwardly accounted for by the hypothesis (21) if we adopt Kuroda's (1988) proposal on the landing site of scrambling:



Assuming the VP-internal subject hypothesis in (31), Kuroda (1988) suggests that short-distance scrambling of object NP involve movement to the Spec of AGRsP (in Kuroda's term IP) while subject NP remains in-situ within VP:



Therefore, the fact that the landing site of short-distance scrambling in

Japanese can be either A or A-bar positions is compatible with the assumption in (21) if we adopt Kuroda's hypothesis.<sup>9</sup>

Thus far we have argued, from some empirical facts, that the Spec of AGRsP can be either A or A-bar positions, which accounts for the main-clause ECP effect in terms of the notion of Economy. Thus we can avoid one of the theoretical problems which Culicover (1993) points out for the ECP account of the *that-t* effect. However, some other questions come to our mind: why is it that only the Spec of AGRsP can function as either A or A-bar positions?; where does the dual nature of the Spec of AGRsP come from?; can the Spec of CP, which typically functions as an A-bar position, or the Spec of VP, which is a typical A position where an argument of a verb is base-generated and assigned some  $\theta$ -role, be ambiguous between A and A-bar positions?

Adopting the notions of  $\pm L$  and  $\pm \theta$ -relatedness (see Ikeuchi 1990, who cites Chomsky's class lecture in the fall of 1988), I suggest that they are relevant to the dual nature of the Spec of AGRsP.  $\pm L$  and  $\pm \theta$ -relatedness can be defined as follows:

(33)  $\pm L$ -relatedness/ $\pm \theta$ -relatedness:

a. L-related:

$\alpha$  is L-related to  $\beta$  iff  $\alpha$  and  $\beta$  are covered by the same XPs and  $\beta$  is an L-category, where L-categories are N, V, A, P and T (in Ikeuchi's term I(nfl)).

b.  $\theta$ -related:

$\alpha$  is  $\theta$ -related iff  $\alpha$  either  $\theta$ -marks or is  $\theta$ -marked.

According to (33), we can make a proper distinction of the following types of specifiers, assuming that at Overt Syntax Tense moves to the head of AGRsP:

(34) a. Spec of VP: [+L, + $\theta$ ]

b. Spec of AGRsP: [+L, - $\theta$ ]

c. Spec of CP: [-L, - $\theta$ ]

Notice that in (34) the Spec of AGRsP belongs to the two types of specifiers in the sense that it has both [+L] feature, which is a property of a typical A position of the Spec of VP, and [- $\theta$ ] feature, which shows a property of a

typical A-bar position of the Spec of CP. Thus, from the above distinction of the specifiers I conjecture that the dual nature of the Spec of AGRsP is due to the sharing of the different kind of features, i.e., [+L] and [- $\theta$ ].

In this subsection we have mainly argued that the main-clause ECP effect is no longer problematic for the ECP analysis of the *that-t* effect. We have seen that the notion of Economy, in particular, Economy of Derivation, or the last resort principle of Chomsky (1991; 1993) is relevant to ruling out the main-clause ECP effect. This result can be achieved by proposing that the Spec of AGRsP has a dual function: it can be either A or A-bar positions. In the next subsection, I will provide a piece of empirical evidence against the "surface filter account" of the *that-t* effect.

### 2.3. *Embedded Topicalization and That-t Effects*

Let us go back to the following contrast in (1) repeated here as (35) for ease of exposition:

- (35) a. Robin met the man who<sub>i</sub> Leslie said that *for all intents and purposes* t<sub>i</sub> was the mayor of the city.  
 b. \*Robin met the man who<sub>i</sub> Leslie said that t<sub>i</sub> was the mayor of the city.

As we have seen above, Culicover (1993) suggests that the contrast shown in (35) be straightforwardly captured by the "surface filter account" originally proposed by C&L (1977):

- (36) \*<sub>S</sub>[<sub>S</sub> that [<sub>NP</sub>e]...], unless S' or its trace is in the context:  
 [<sub>NP</sub>\_\_\_...]

However, let us consider another kind of example which appears to be exempt from filter (36). First of all, consider the following example:

- (37)??What<sub>i</sub> do you think that [to Mary]<sub>i</sub>, John gave t<sub>i</sub> t<sub>2</sub>?

(37) exhibits a weak island effect. More specifically, the topic phrase

to *Mary*, which is adjoined to the embedded AGRsP, induces a Relativized Minimality effect (Rizzi 1990) since it is in an operator position.<sup>10</sup> Thus, if an embedded subject undergoes *wh*-movement across a topicalized element in an embedded clause, we predict that the sentence only yields a weak island violation because the output does not violate the surface filter in (36): the complementizer *that* and the trace of *wh*-movement of subject are separated by the intervening topic phrase, which is parallel to examples such as *who do you think that tomorrow t<sub>1</sub> will leave?* The relevant output can be represented as in (38), where S' is replaced by CP:

(38) [<sub>CP</sub> [<sub>C</sub> that [<sub>AGR<sub>S</sub>P</sub> TOPIC [<sub>AGR<sub>S</sub>P</sub> [<sub>NP</sub> e].....]]]]]

However, this prediction is not borne out. Consider the following example involving the interaction between embedded topicalization and *wh*-movement of embedded subject:

(39) \**Who<sub>1</sub> do you think that [to Mary]<sub>2</sub>, t<sub>1</sub> gave the book t<sub>2</sub>?*

Sentence (39) is worse than (37). It seems that not only a weak island effect but some violation of another principle is relevant to the ill-formedness of (39). I suppose that the ECP is the best candidate for the principle. Notice here that the degree of the ill-formedness of (39) is rather similar to (40), where the combination of an ECP violation and a Relativized Minimality effect is involved:

(40) \**Who<sub>1</sub> do you wonder whether t<sub>1</sub> left early?*

Therefore, judging from the total unacceptability of (39), we can conclude that the "surface filter account" of the *that-t* effect is untenable.

To summarize, in this section we have seen that one of Culicover's (1993) arguments against the ECP account of the *that-trace* effect cannot be supported from a theoretical viewpoint. That is, the main-clause ECP effect, which appears to be problematic for the ECP analysis of the *that-t* effect, can be excluded by proposing that the Spec of AGRsP has a dual function with respect to A/A-bar distinction and that the notion of Economy is relevant to ruling out

that effect. Furthermore, we have demonstrated that the "surface filter account" of the *that-t* effect empirically leads to a wrong prediction of a sentence involving the interaction between embedded topicalization and the *wh*-movement of embedded subject.

In the next section we will discuss the reason the *that-t* effect can be suspended if some adverbs, not topicalized elements, intervene between the complementizer and the trace of subject. We will deal with another problematic case of the ECP account of the *that-t* effect which Culicover (1993) raises. We will consider the status of intermediate traces, suggesting that the apparent problematic case can be solved in terms of Economy of Representation.

### 3. The Position of Adverbial Phrases and the PolP Hypothesis

In this section I will show that the *that-t* effect can be suspended if another kind of functional head, namely, the head of PolP is available in the X-bar schema and it properly head governs the empty category produced by *wh*-movement of subject. I will further state a condition on the existence of PolP in the X-bar schema on the basis of the notion of Economy.

First of all, let us consider the following sentence:

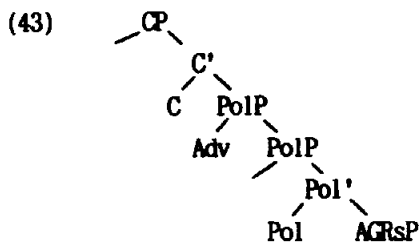
- (41) Robin met the man who<sub>i</sub> Leslie said that *for all intents and purposes* t<sub>i</sub> was the mayor of the city.

I propose that the suspension of the *that-t* effect is ascribed to the position of adverbial phrases. So the question is where they are placed. I claim here that adverbial phrases such as *for all intents and purposes* are adjoined to PolP instead of being moved to the Spec of PolP since it does not induce Subject-Aux Inversion:<sup>11</sup>

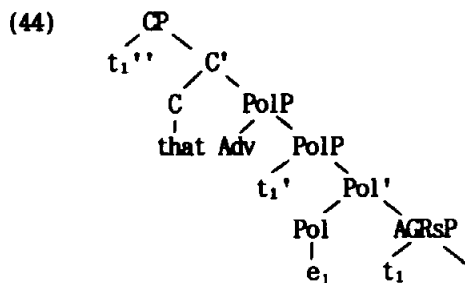
- (42) \*Leslie said that *for all intents and purposes* was Robin the mayor of the city.

Thus, the representation of (42) is represented as follows:





Given the structure of (43), let us consider the abstract configuration of (41) relevant to our argument here:



In (44) the trace in subject position is properly head governed by the empty head Pol which is coindexed with the intermediate trace by the Spec-head relation. Following L&S (1992), I assume the following mechanism of coindexation:

- (45) The index of Spec is copied onto the head only if the Spec and the head agree with respect to the feature  $[\pm WH]$ .

I further assume, following L&S (1992), that the status of overt or covert complementizers and traces with respect to  $[\pm WH]$  is as follows:

- (46) The complementizer *that* is  $[-WH]$ , whereas traces and empty complementizers are not marked for the  $[\pm WH]$  feature.

Notice that in (44) the empty head Pol<sup>0</sup> is not marked for  $[\pm WH]$  and that this is compatible with the *wh*-feature of an intermediate trace, which is not marked for  $[\pm WH]$ . Therefore, assuming the mechanism of coindexation and the status of complementizers and traces, we can account for the suspension of the

*that-t* effect on the basis of the PolP hypothesis.

However, we must consider the status of intermediate traces in the Spec of PolP. If an intermediate trace remained in the Spec of PolP, it would violate the ECP because the complementizer *that* cannot act as a proper head governor for the reason mentioned above. This fact is indicated in (47), where a typical *that-t* effect is involved:

(47) \*Who<sub>i</sub> do you think that t<sub>i</sub> left early?

Along the lines of L&S (1984), I adopt the mechanism of  $\gamma$ -marking and assume that the intermediate trace is deleted at LF. Thus we can correctly predict that the *that-t* effect is suspended in configurations such as (44). However, as Culicover (1993) suggests, if PolP were present in the phrase structure of (47), we would wrongly predict that sentences such as (47) are grammatical: the intermediate trace in the Spec of PolP, which is coindexed with its original trace and thus  $\gamma$ -marks it, could be deleted at LF. I propose here that the following condition is relevant to the existence of PolP:

(48) A projection can be generated as it is needed.

(48) indicates that the existence of PolP is forced by some external factors such as adjunction to PolP, or substitution to the Spec of PolP. I conjecture that the condition in (48) derives from the notion of "Economy", in particular, Economy of Representation, which states that no superfluous symbol is included in a representation at LF. Therefore, the functional projection of PolP does not appear in the X-bar schema if there is no element to adjoin to PolP or to substitute to the Spec of PolP. This state of affairs seems to be analogous to the case of the configuration of the following matrix declarative sentence:

(49) John left early.

If CP projection were involved in (49), the configuration would be the following:

(50) [<sub>CP</sub> [<sub>C</sub> e [<sub>TP</sub> John left early]]]

If (50) were correct, the sentence would violate the ECP because the empty head of CP cannot be properly head governed. The fact that the empty head of CP is subject to the ECP is indicated by the following sentences in which CPs undergo topicalization (Stowell 1981):

- (51) a. That he was honest, Mary thought t  
 b. \*he was honest, Mary thought t

Notice here that it is natural to assume that both of the preposed elements in (51) are CPs since the verb *think* selects only CP, not AGRsP. In other words, in (51) the projection of CP is required by semantic selection of the verb *think*. Thus, the internal structure of the preposed element in (51b) is represented as follows:

- (52) [<sub>CP</sub> [<sub>C</sub> e [<sub>AGRSP</sub> he was honest]]], Mary thought t

In (52) the empty head of CP cannot be properly head governed, yielding a violation of the ECP.<sup>12</sup> Therefore, given that the empty head of CP is subject to the ECP, the well-formedness of (49) suggests that it involve no CP projection in the X-bar schema, which is compatible with (48) since in (49) there is no element which semantically selects CP.<sup>13</sup>

Let us return to (47). If a projection is generated only when it is needed, it follows that the projection of PolP does not appear, yielding an ECP violation, since the [ $\pm$ WH] features of the complementizer *that* and the intermediate trace are incompatible:

- (53)
- 
- ```

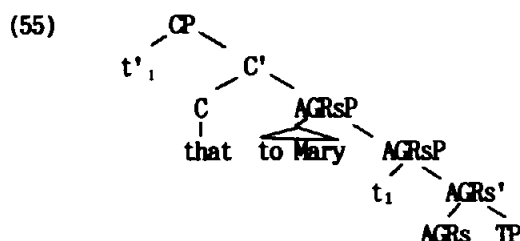
graph TD
  CP --> t1_prime[t1']
  CP --> C_prime[C']
  C_prime --> C[C]
  C --> that[that]
  C --> AGRsP[AGRSP]
  AGRsP --> t1[t1]
  AGRsP --> VP[VP]
  that --- WH[-WH]
  
```

In (53) no coindexation occurs between the Spec of CP and the head of CP, and thus the original trace in the Spec of AGRsP cannot be properly head governed, resulting in a violation of the ECP.

The hypothesis in (48) makes it possible to explain why sentences such as (39), which involve the interaction between embedded topicalization and the extraction of embedded subject, are ill-formed, even if their surface outputs are similar to those of sentences in which the *that-t* effect is suspended:

(54) \*Who<sub>1</sub> do you think that [to Mary]<sub>2</sub>, t<sub>1</sub> gave the book t<sub>2</sub>?

I assume, following L&S (1992), that the topicalized element in (54) is adjoined to AgrSP, and thus PolP cannot appear in the X-bar schema. The configuration of (54) is represented as follows:



In (55) the original trace left by *wh*-movement of subject cannot be properly head governed by the head C<sup>0</sup> due to the incompatibility of [ $\pm$ WH] feature between the head C<sup>0</sup> and the intermediate trace in the Spec of CP.

So far we have discussed the reason the suspension of the *that-t* effect is possible when an adverbial phrase intervenes between complementizers and traces. We have also seen that the apparent problematic case for the PolP hypothesis, which involves a typical *that-t* effect, can also be handled in terms of the notion of Economy of Representation. However, let us consider the sentence in (6), repeated here as (56):

(56) I said that *under no circumstances would* John run for any public office.

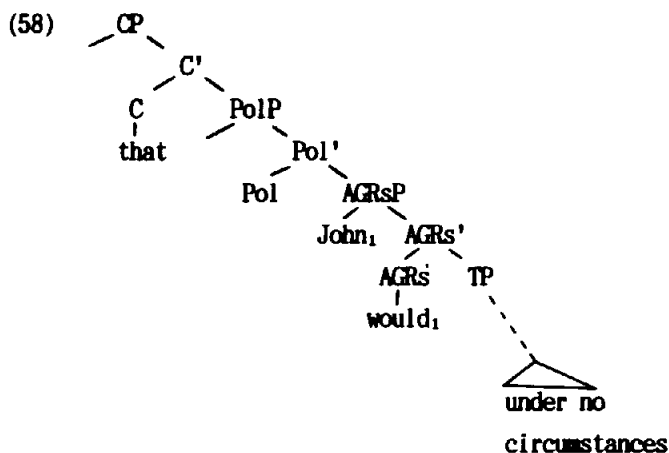
As we have seen above, sentences involving SAI as in (56) indicate that the functional projection of PolP is involved, since a head must move to another head position according to the structure-preserving hypothesis (Chomsky 1986). Furthermore, occurrence of SAI in (56) suggests that the negative element *under*

*no circumstances* be in the Spec of PolP. Keeping this in mind, consider the following sentence in (10), repeated here as (57):

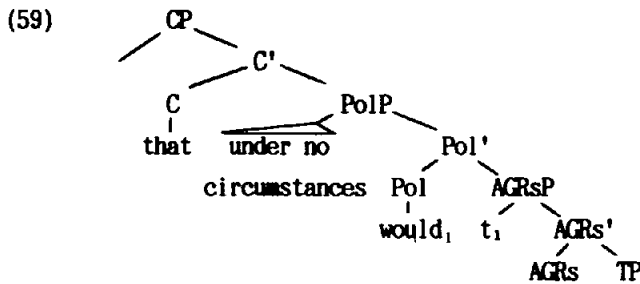
- (57) *Who<sub>1</sub> did you say that under no circumstances would t<sub>1</sub> run for any public office?*

In (57) the subject *who* moves to the Spec of CP across the negative element in the Spec of PolP. Thus no coindexation can occur between the Spec of PolP and its head since the Spec of PolP is occupied by the negative element. Then, how can the ECP be satisfied in (57)?

To begin with, let us consider the configuration in (56) before the application of SAI:



Notice that in (58) Spec-head agreement can be established between the subject *John* and the auxiliary verb *would* within AGRsP and that coindexation between them takes place. Therefore, even after the application of SAI, the auxiliary verb *would* still retains its index and the trace left by the extraction of subject is properly head governed. Consider (59), where both SAI and the extraction of subject are involved:



In (59) the trace in subject position is properly head governed by the head *would*, which is coindexed with the subject by the Spec-head configuration before the application of SAI. Thus the well-formedness of sentences such as (57) can be correctly accounted for in terms of the ECP.<sup>14</sup>

To summarize, in this section we have seen that the suspension of *that-t* effect can be captured by the ECP account on the assumption that Culicover's (1993) argument against the ECP account of the *that-t* effect is untenable. Furthermore, we have argued that the existence of PolP in the phrase structure depends on the principle of Economy of Representation, which can correctly rule out sentences involving typical *that-t* effects or sentences with the interaction between embedded topicalization and the extraction of embedded subject.

#### 4. Concluding Remarks

In this article we have claimed that the ECP account of the *that-t* effect is still on the right track, arguing against Culicover's (1993) suggestion based on the "surface filter account" of the *that-t* effect. First of all, we have seen that one of the apparent problematic cases which Culicover regards as crucial defects for the ECP account can be solved by the notion of Economy of Derivation. Secondly, we have provided a piece of empirical data which cannot be straightforwardly handled by the surface filter account, which indicates that Culicover's (1993) suggestion is no longer tenable. Finally, we have argued that the suspension of the *that-t* effect can be better captured by the interaction between the PolP hypothesis and Economy of Representation.

## NOTES

\*I am grateful to Yukio Hirose, Katsuo Ichinohe, Mikinari Matsuoka, Joe Morita, Koichi Takezawa, Hideki Tanaka, Ryuichi Washio, Takashi Yoshida, and especially to Robyne Tiedeman for inspiring comments and suggestions.

<sup>1</sup> See also Hasegawa (1993), who reaches the same conclusion and provides an alternative analysis on the basis of a certain phonological constraint similar to the surface filter of C&L (1977). For other kinds of analyses of the *that-t* effect, see Fukui (1993) and Takahashi (1991), who suggest that the *that-t* effect be reduced to Economy of Derivation. I will not pursue the possibility here. For some relevant argument, see Hoshi (in prep).

<sup>2</sup> C&L's surface filter excludes the case where the phonologically empty element [<sub>NP</sub> e] is pro. For details, see C&L (1977).

<sup>3</sup> We will discuss the position of intervening adverbs in section 3.

<sup>4</sup> In the case of the head government of the trace left by *wh*-movement of object NP, I assume, following Stowell (1981), that the  $\theta$ -grid of a verb inherently has the same index as its internal argument. Thus, it follows that the trace left by *wh*-movement of object NP can be properly governed by a given verb. Alternatively, if object NP moves from the Spec of AGRoP to Spec of CP in a successive cyclic way, the head of AGRoP can be coindexed with the object NP and thus the head AGRo<sup>0</sup> can properly govern the trace. I am grateful to Mikinari Matsuoka (personal communication) for bringing this matter to my attention.

<sup>5</sup> Katsuo Ichinohe (personal communication) has pointed out to me that the following sentence appears to be problematic if we assume (21):

(i) \*I think that *who* left early.

In (i) if the *wh*-feature of *who* were checked off in the embedded Spec of AGRsP, the sentence would be wrongly predicted to be grammatical. To avoid this kind of problem, I assume, following Stowell (1981), that the embedded AGRs<sup>0</sup>, which merges with the embedded T<sup>0</sup> at Overt Syntax, is raised to the head C<sup>0</sup> at LF for the interpretation of Tense and that semantic selection by a given verb of a matrix clause must be compatible with an embedded clause selected by the matrix verb. Thus, since in (i) the verb *think* cannot select *wh*-clauses, the em-

bedded sentence is not licensed as a *wh*-clause, yielding ill-formed sentences such as (i).

<sup>6</sup> See Hoshi (1993), who suggests that the feature of Spec is copied onto the head only if both the Spec and its head are occupied by some morphological overt element. This implies that the head AGRs<sup>0</sup> can independently bear a [+WH] feature.

<sup>7</sup> If *did* remains at the head AGRs<sup>0</sup> and the *wh*-element is in the Spec of AGRsP, the sentence is predicted to be well-formed. This prediction seems to be borne out. Let us consider the following sentence, where *did* is emphasized:

- (i) Who DID leave early?

Sentences such as (i) are grammatical for the same reason as the following declarative sentence involving the emphatic *did* is also grammatical:

- (ii) John DID leave the room.

<sup>8</sup> However, there is another sort of example which must be accounted for, namely, Heavy NP Shift (HNPS) of subject. Rizzi (1990) argues that HNPS of subject is impossible due to the failure of proper head government of the subject trace:

- (i) \*Are  $t_i$  intelligent [all the students who can solve this problem]<sub>i</sub>?

In (i) the head C<sup>0</sup> is inert for government since it is occupied by the overt element *are*. Thus Rizzi claims that (i) violates the ECP. However, arguing against Rizzi's claim, I suggest that (i) also violates Economy of Derivation. Following Nishikawa (1990), I assume that HNPS is movement to the Spec of AGRoP, which is positioned to the right side of the head AGRo<sup>0</sup>. Moreover, as Watanabe (1993) claims, I adopt the following Economy constraint:

- (ii) Theorem of Economical A-Movement:

A-movement cannot move through a Case position.

Thus, sentences such as (i) can be excluded as a violation of the Economy



constraint in (ii).

<sup>9</sup> However, see Abe (1993), who attempts to explain these peculiar properties of scrambling without A/A-bar distinction.

<sup>10</sup> Following L&S (1992), I assume that topicalization involves adjunction to AGRsP. See the discussion in section 3.

<sup>11</sup> I assume here that AGRsP-adjoined positions are regarded as operator positions and that AGRsP-adjoined categories can be interpreted as operators (e.g. Quantifier Raising at LF, see May (1977)). Thus intervening adverbs such as *for all intents and purposes* cannot be adjoined to AGRsP since they are not interpreted as operators. This assumption is compatible with the fact that intervening adverbs do not induce Relativized Minimality effects due to the non-operator status of the adverbs.

<sup>12</sup> Consider the following sentence:

(i) Mary thought [<sub>CP</sub> e [<sub>AGR<sub>s</sub>P</sub> he was honest]]

In (i) the empty head C<sup>0</sup> is inherently coindexed with the verb *thought* by a head-head relation, resulting in satisfying the ECP.

<sup>13</sup> I assume here that the empty head Pol<sup>0</sup> can be licensed by the head C<sup>0</sup> which strongly selects PolP in the sense that the order of functional categories is fixed.

<sup>14</sup> Oka (1993) provides the following sentence involving the suspension of the ECP (*wh-t*) effect, which seems to be compatible with our proposal:

(i) Who<sub>1</sub> did you ask whether under normal circumstances t<sub>1</sub> would win the election?

For further details of the analysis of (i), see Oka (1993).

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