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Larsonian CP Recursion, Factive Complements, and Selection

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This paper argues that CP recursion holds the key to understanding the properties of factive complements and embedded Topicalization, where CP recursion is intended to mean direct stacking of CPs. Our central claim is twofold: first, that both factive complements and embedded Topicalization involve CP recursion; second, that CP recursion is created by substitution movement of C° , resulting in the structure $[CP \text{ that}_i [CP \text{ Op/Top } [C' \text{ t}_i]$. The goal of this paper is to tie together various properties of factive complements that are noted in the literature but are left unrelated.

In section 1, we will review Authier (1992), where the CP recursion analysis of embedded Topicalization is articulated. In section 2, we proceed to argue that the properties of factive complements are explained if they also involve CP recursion. Furthermore, we will claim that recursive CP structure is created by movement of C° . In section 3, we will see that the CP recursion analysis also applies to the negative complementizer proposed by

Progovač (1988) and Laka (1990). Section 4 discuss some theoretical consequences.

1. Embedded Topicalization

1.1. CP recursion analysis of embedded Topicalization

There are two proposals in the literature about how embedded Topicalization like (1) should be analyzed.

(1) John said that this book, Mary should have read.

A treatment represented by Higgins (1973) and Chomsky (1977) analyzes it as involving substitution into Spec of CP; while the other analysis, proposed by Baltin (1982) and Lasnik and Saito (1992), claims that it is derived by adjunction to IP. Here I will develop a variety of the CP Spec substitution analysis, called the CP recursion analysis, according to which (1) is assigned the following structure:

(2) John said [_{CP} that [_{CP} this book, [_{IP} Mary should have read]]]

Authier (1992) argues for the substitution analysis of Topicalization by observing that Topicalization is restricted to the same embedded environments as Negative Inversion. On the assumption that V2 configuration always involves movement to C° (cf. Besten (1983)), the existence of Negative Inversion in embedded contexts itself argues for the necessity of CP recursion.

Authier's observation, which draws on Hooper and Thompson (1973), is that only the embedded clauses that allow deletion of that complementizer also allow Negative Inversion and Topicalization.^{1,2}

¹ Vikner (1990) notes that only a restricted class of verbs allow embedded V2 in the Mainland Scandinavian Languages and German. The Mainland Scandinavian languages are especially significant, since the embedded Topic appears to the right of a complementizer, as in a Danish example (i).

(i) Vi ved [at [denne bog har han ikke læst]]
 we know that this book has he not read

It is also significant that the class of verbs that do not allow embedded V2 in these languages seems almost the same as the class of verbs that do not allow embedded Topicalization in English.

Thus, factive complements³ (Kiparsky and Kiparsky (1971)) do not allow either of them as in (4) and (5), in contrast to cases like (3).

- (3) a. John said that Sue, Bill doesn't like.
 b. Mary kept saying that never in her life had she seen such a thing.
- (4) a. *John regretted that Gone with the Wind, we went to see.
 b. *John regretted that never had he seen Gone with the Wind.
- (5) a. *The fact that Bill, Mary likes makes John very jealous.
 b. *The fact that never has he had to borrow money makes him very proud.

If Topicalization obeys the same restriction as Negative Inversion, which involves CP recursion, then we can assume that embedded Topicalization also requires CP recursion.

Authier left open why Topicalization is impossible in factive complements. We will turn to this question in section 2. Before doing so, however, we will review another result of Authier (1992).

1.2. Clause typing

The CP recursion analysis has to face a word order problem, which is illustrated in (6) and (7).

- (6) a. John said that this book, Mary should have read.
 b. *John said this book that Mary should have read.
- (7) a. ?I wonder why, a book like this, we should give to Bill.
 b. *I wonder a book like this, why we should give to Bill.

Embedded Topics appear to the right of the complementizer that and wh-phrases. According to the CP recursion analysis, the well-formed Topicalization has the following structures:

- (8) a. ... [_{CP} [_C that [_{CP} Topic [_C \emptyset] _{IP}

² Note that the strength of judgments varies from speaker to speaker. Note also that Negative Inversion seems to be less sensitive to the restriction, as pointed out by D. Pesetsky (p. c.) and a reviewer of Authier (1992, note 5). We will ignore these subtleties.

³ Hooper and Thompson (1973) and Hooper (1974) note that the class of verbs that are dubbed as semifactives by Karttunen (1971) do allow embedded Topicalization. It is beyond the scope of this paper to discuss them.

b. ... [CP wh-phrase [C' \emptyset [CP Topic [C' \emptyset [IP

Authier (1992) argues, attributing the idea to a reviewer, that Topics appear in the lower CP in (8a), because the higher CP, selected as a non-wh clause, cannot host anything in its Spec. In (8b), on the other hand, the higher CP, selected as a wh-clause, must have a wh-phrase in its Spec, leaving no room for a Topic phrase. Adopting this idea, let us say the following:

(9) Clause Types

There are only two types of clauses to be selected by a verb, namely, wh-clauses and non-wh clauses. The former are characterized by the presence of a wh-phrase in Spec of the topmost CP. The latter are characterized by empty Spec of the topmost CP.

This belongs to the theory of clause typing in the sense of Cheng (1991), who proposes that wh-clauses have to be marked either by C° or elements in Spec of CP. As we will see, (9) plays an important role in deciding the shape of complement clauses.

Let us now turn to the question why embedded Topicalization is impossible in factive complements.

2. Factive Complements

2.1. Factive operator

A significant property of factive complements which is widely discussed in the recent literature is the fact that adjunct extraction out of factive complements is blocked.⁴ Thus (10) cannot be interpreted such that why modifies the lower clause.

(10) *Why does John regret [that Bill issued the order t]_i?

Recently, Cinque (1990), Hegarty (1991), and Melvold (1991), among others, have proposed various solutions, but here we will pick out Melvold's and modify it. If we are on the right track, other proposals must be off the track.

⁴ There are a class of nonfactive complements that block adjunct extraction, as Cattell (1978) points out. See Hegarty (1991) for a recent discussion. Here, we will ignore this class of verbs.

Melvold argues that factive complements have an operator in Spec of CP, as in (11).

(11) John regrets [_{CP} Op [that [_{IP} he fired Mary]]]

She intends, by positing the operator, to represent the definiteness of factive complements since their truth is presupposed.^{5,6} She argues that the presence of an operator in Spec of CP blocks adjunct extraction, just as wh-islands block adjunct extraction in (12).⁷

(12) *Why did Bill wonder [who fired Mary]?

Melvold's proposal does not extend to the impossibility of embedded Topicalization within factive complements in its original form, but there is a way of modifying it. Notice that the clause structure illustrated in (11) is not compatible with (9), adopted in the previous section. A factive complement is non-wh, but the factive operator occupies Spec of the single CP. This problem can be avoided by placing the iota operator in Spec of the lower CP, that is, by resorting to CP recursion. Then, the structure of a factive complement should be as follows:

(13) John regrets [_{CP} that [_{CP} Op [_{IP} he fired Mary]]]

Then, the topmost CP has nothing in its Spec, conforming to (9).

⁵ She generalizes the account to definite DPs, which even block extraction of arguments, as shown by the following contrast.

(i) a. ??Who did John find the picture of?

b. Who did John find a picture of?

⁶ Cinque (1990) claims that islandhood of factive complements is due to their position, pointing to German for the evidence that factive complements are higher than V'. In German, definite DPs undergo scrambling. If factive complements are no exceptions, we are led to suppose that the height of factive complements is due to scrambling.

⁷ The data on argument extraction is not clear cut. Cinque (1990) assumes that argument extraction from factive complements is possible, while Melvold notes individual variation. It is possible that the subtlety here is comparable to what we find with wh-islands. Cf. Hegarty (1991) and Rooryck (to appear) for subject/object asymmetry.

Now, our proposal that places the factive operator in the lower CP enables us to explain the impossibility of Topicalization in factive complements,⁸ which Melvold's proposal cannot explain. Suppose that CP recursion is allowed only once. In other words, let us stipulate for the moment that the following structure is not allowed:

(14) * $[_{CP} [C \text{ that } [_{CP} C^{\circ} [_{CP} C^{\circ}]]]]$

Then, if we try to Topicalize within a factive complement, there will be no slot for a Topic phrase, as can be seen from (13). A Topic cannot be placed in Spec of the higher CP as in (15), since factive clauses are non-wh.

(15) *John regrets $[_{CP}$ Mary that $[_{CP}$ Op $[_{IP}$ he fired t]]]

A Topic cannot be placed in Spec of the lower CP either, since that position is already taken up by the factive operator.

To sum up, our proposal that factive complements require CP recursion to host a factive operator in Spec of the lower CP accounts for the impossibility of adjunct extraction from factive complements and the impossibility of Topicalization within factive complements at the same time.^{9,10}

2.2. Larsonian CP recursion

⁸ Iatridou and Kroch (1992) also note the correlation of adjunct extractability and embedded Topicalization, claiming that ungoverned clauses prevent licensing of the lower CP. This stipulation becomes unnecessary under our proposal.

Their analysis predicts that CP recursion is impossible in matrix clauses, but the cases like (i) indicate that CP recursion is needed for matrix clauses as well, though space limitation prevents us from going into discussion of the difference from (7) in word order.

(i) ?This book, to whom should Bill give?

⁹ Our account cannot explain the fact that embedded Topicalization is allowed even in factive complements in Icelandic and Yiddish. See Diesing (1990), Rögnvaldsson and Thráinsson (1990), Cardinaletti and Roberts (1991) and Bobaljik and Jonas (1992).

¹⁰ Notice that the IP adjunction analysis cannot capture these two facts in a unified way without further ado.

Although factive complements are non-wh and therefore the factive operator has to appear in Spec of the lower CP, there is a sense in which the lower CP with a factive operator is selected by the higher verb. As it stands, the structure of CP recursion prevents a direct selectional relation between the higher verb and CP₂ in (16).

(16) ...regret [CP₁ that [CP₂ Op [C' [IP ...

To solve this problem, I propose that CP recursion is created by movement of a complementizer with the resultant structure (17).

(17) [CP that_i [CP Op [C' t_i [IP

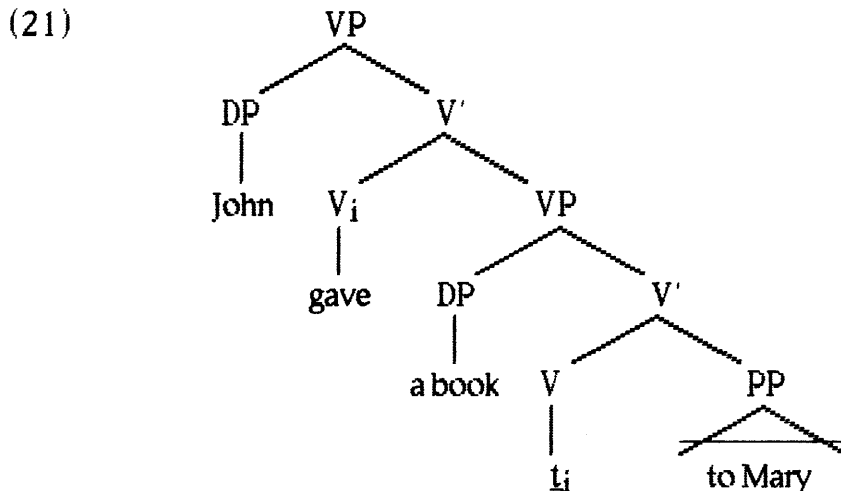
Here we are applying Larson's (1988) analysis of diadic predicates like *give*. Larson argues that verbs which take three arguments as in (18) are derived by movement of V.

(18) John gave a book to Mary.

Proposing the principle of argument realization (19) and adopting the binary branching X-bar theory, Larson claims that (18) must involve VP recursion, since we can get at most (20) with a single maximal projection of a verb. The "minimal, purely structural elaboration" (Larson 1988, 384) of (20) is (21), which is derived by verb raising.

(19) If α is a predicate and β is an argument of α , then β must be realized within a projection headed by β .

(20) [VP a book [Vⁱ gave [PP to Mary]]]



Returning to CP recursion in factive complements, notice that the situation is quite similar: we have conflicting demands from the theory of clause typing and selection of the factive operator. Selection of the factive operator requires the structure in (22).

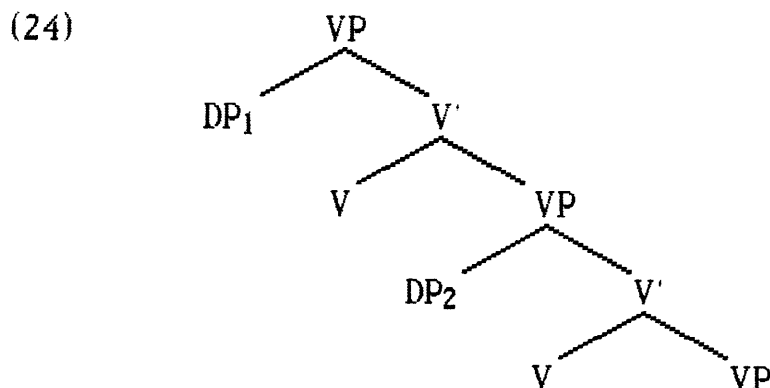
(22) $[_{CP}Op[C\text{ that }[_{IP} \dots$

This, however, violates another selectional requirement coming from the theory of clause typing: Spec of non-wh clauses must be empty. To resolve this violation, the complementizer undergoes movement, creating (23).

(23) $[_{CP1} \text{that}_i [_{CP2} Op[C\text{ that}_i [_{IP} \dots$

Here there is a sense in which CP₂ is also selected by the higher verb, since it is a projection of the complementizer that_i, which holds a direct selectional relation with the verb.

The Larsonian analysis of CP recursion brings to light another parallel between the two instances of recursion. In the account of the impossibility of embedded Topicalization in factive complements in section 2.1, we have assumed that CP recursion takes place only once. Now, an analogous problem occurs in the case of VP recursion as well.¹¹ Hale and Keyser (1991) claim that VP recursion is allowed only once, in order to restrict the argument structure of a single verb. Thus they observe that no verb corresponds to the structure like (24).



¹¹ Larson's original proposal allows an infinite number of VP recursion and is intended to accommodate adverbs as well in VP structure. Given Hale and Keyser's (1991) claim, this aspect of Larson's analysis has to be abandoned.

Their explanation is that VP never functions as a predicate and therefore the inner subject, namely, DP₂, is not licensed. By the same reasoning, the external argument DP₁ is not licensed either. In fact, Hale and Keyser propose instead that the external θ -role is constructionally assigned in Spec of IP, leaving the status of the VP-internal subject hypothesis unclear.

Their position is in a direct conflict with Larson's (1988) principle of argument realization (19), which requires every argument of a predicate to appear within a projection of that predicate. Remember that it is the principle (19) in combination with X-bar theory which forces VP recursion. Notice that the VP-internal subject hypothesis also follows from (19). For this reason, we will not adopt Hale and Keyser's explanation but simply state the following as a general property of recursion.

- (25) Category recursion by substitution operation is allowed only once with a single lexical item.

Although (25) remains to be explained, it restricts CP recursion as well, giving us the right result. We will return to (25) in section 2.4.

2.3. Comp-trace effect with embedded Topicalization

The Larsonian analysis explains the "that-trace effect" observed with embedded Topicalization. Lasnik and Saito (1992) claim that local Topicalization of subjects is impossible, on the basis of the contrast like (26).

- (26) a. ?Which athletes do you wonder which pictures of Mary bought?
 b. ??Which athletes do you think that pictures of, Mary bought?
 c. ?Which athletes do you wonder which pictures of are on sale?
 d. ?*Which athletes do you think that pictures of, are on sale?

They argue that (26d) cannot have the structure (27), since extraction out of a phrase in an A'-position is marginally allowed as in (26a-c) but (26d) is significantly worse than them.

- (27) Which athletes_i do you think that [pictures of t_i] t_j are on sale

Lasnik and Saito have an account of the impossibility of (27), based on the IP adjunction analysis of Topicalization. This fact thus poses a significant challenge to the CP recursion analysis of Topicalization.

The Larsonian analysis of CP recursion provides a straightforward account of why (27) is impossible, assimilating it to the ordinary that-trace effect. For the present purposes,¹² we will adopt Rizzi's (1990) analysis of the that-trace effect, which states that the complementizer that, which is inert for government, cannot head-govern the subject trace, ruling out cases like (28).

(28) *who do you think [that t left]?

Suppose that the trace of the complementizer that inherits the property of that, including inertness for government. Then, the structure (29), which is assigned to (26d) under the Larsonian analysis, is ruled out due to the fact that the subject trace t_j is not head-governed.

(29) Which athletes do you think [_{CP}that_i [_{CP}pictures of]_j t_j [_{IP} t_j are on sale]]

Notice that the CP recursion analysis of Topicalization which does not assume movement of C° cannot explain the ill-formedness of (29) in a non ad-hoc way.¹³ Thus the Larsonian CP recursion receives a strong support.

2.4. Speculation about the limitation on category recursion

It is well known that factive complements do not allow deletion of the complementizer, as the following example from Authier (1992) shows.

(30) John regretted *(that) we went to see Gone with the Wind.

Relatively overlooked is the fact that that deletion is not allowed when embedded Topicalization takes place, as illustrated in (31).¹⁴

(31) a. John said *(that) this book, Mary should have read.
b. John said (that) Mary should have read this book.

¹² See Watanabe (in preparation) for a more general approach.

¹³ The same criticism applies to the Polarity Phrase analysis of Culicover (1991).

¹⁴ Reinholtz (1990) notes the same contrast in Comp deletability in Mainland Scandinavian languages. Rochemont (1989) notes the English fact. Thanks to M. Authier for the latter reference.

Recall that factive complements and embedded Topicalization both involve CP recursion. The generalization here is the following:

- (32) CP recursion disallows deletion of the complementizer of the higher CP.

Above, we have reached the conclusion that category recursion is allowed only once. Now, the fact about that deletion seems to be pointing to the relevance of head identification in this connection. An intuitive feel about deletability of that in cases where no CP recursion is involved is that CP structure is somehow recoverable from the context. That is, the presence of a higher verb which selects a CP complement is sufficient to identify CP structure even when there is no visible complementizer. Recursive CP structure, on the other hand, is unrecoverable if there is no visible complementizer. This is nothing more than a speculative remark, but the same line of thought can explain lack of repeated CP recursion, as in (33).

- (33) * $[XP_1 X^0_1 [XP_2 t_1 [XP_3 t_1]_P \dots$

Assuming that traces are on a par with null complementizers in the relevant respects, (33) is basically the same as the schematic structure (34) for the impossible cases of that deletion.

- (34) * $[CP_1 \emptyset_1 [CP_2 t_1]_P \dots$

Both in (33) and in (34), there are two coindexed null heads. In this configuration (XP_2 and XP_3 in (33); CP_1 and CP_2 in (34)), the lower null head fails to be identified because the immediately dominating, coindexed head is null, causing the trouble. Although it is beyond the scope of this paper to explore the formal status of this identification requirement, the parallel between these two cases is worth noting here.

3. Negative Complementizer

3.1. Laka (1990) and Progovac (1988)

The CP recursion analysis can be extended to the negative complementizer proposed by Progovac (1988) and Laka (1990). Progovac and Laka argue that licensing of negative polarity items in

the complement to the verbs like doubt and deny must be dependent on a special property of Comp, by pointing to the contrast in (35).

- (35) a. The witnesses denied that anybody left the room before dinner.
 b. *The witnesses denied anything.

(35) is supposed to show that we cannot treat the verbs themselves as licenser; we need a special complementizer as licenser.

The details of the special Comp hypothesis are different, however. Crucial for us is that Progovac proposes that an operator occupies Spec of this special complementizer, while Laka claims that the complementizer itself is a licenser. Note the similarity of Progovac's proposal to the factive operator hypothesis discussed above. Here, we will adopt Progovac's proposal about the negative operator, with the modification that the negative operator induces CP recursion, due to the requirement of the Clause-typing theory. We will also assume that negative polarity licensing requires locality (cf. Linebarger (1987)), hence that long-distance licensing of negative polarity items as in (36) involves the negative operator.

- (36) The witnesses didn't say that anybody left the room before dinner.

3.2. Factive complements and Topicalization

Since Kiparsky and Kiparsky (1971) and Ross (1967), it has been noted in the literature that factive complements do not allow long-distance licensing of negative polarity items.

- (37) a. ?*Bill didn't confirm that Roger had eaten anything.
 b. Bill didn't allege that Roger had eaten anything.

This fact receives a by now obvious explanation here. Remember that the complement clauses in (37) must host a factive operator in Spec of the lower CP. Our claim about the negative complementizer, on the other hand, is that it has the following structure.

- (38) [_{CP}Comp_{neg}]_i [_{CP}Op [_Ct]_i [_{TP}...

Since CP recursion is allowed only once and Spec of the higher CP must be empty, there is only one slot for an operator. But the factive operator must exist due to the selectional requirement. In the cases

like (37), the omission of the negative operator leads to failure of negative polarity licensing.

Our analysis also predicts incompatibility of embedded Topicalization and long-distance negative polarity licensing, since Topicalization takes up the only slot available for an operator. This is born out in (39).

- (39) a. John didn't think that Tom introduced Mary to anybody.
 b. *John didn't think that Mary, Tom introduced to anybody.

To sum up, we have claimed that the negative complementizer phenomenon also involves CP recursion, hosting the negative operator of Progovac in the lower CP.

3.3. deny

Lastly, let us consider the verbs like deny in light of our proposal. It should be noted that verbs like deny are classified as disallowing embedded Topicalization by Hooper and Thompson (1973) and Hooper (1974). Note also that these verbs are classified as adjunct extraction blocker by Cattell (1978) and Hegarty (1991). These two properties of the verbs like deny are straightforward consequences of the presence of the negative operator.

4. Conclusion

We have seen that the Larsonian CP recursion analysis of embedded Topicalization and factive complements provides a straightforward account of the properties of these two constructions.

Our proposal has some theoretical consequences. First, the analysis of Topicalization as movement into Spec of CP makes Topicalization consistent with Chomsky's (1992) program in which XP movement is always triggered by the requirement of Spec-head relation. Cf. also Fukui (to appear). Note, at the same time, that the Larsonian analysis of CP recursion puts a Topic in agreement with (the trace of) the [-wh] complementizer that. This perhaps indicates the free-ride character of Topicalization, exemplified by its apparent optionality.

Second, our proposal opens up a new possibility for the syntactic account of complement clause typology. One interesting direction for future research is to examine the classification of complement-clause taking verbs by Cattell (1978), Hooper and Thompson (1973), Hooper (1974). If we are on the right track, adjunct extraction, negative

polarity licensing, embedded Topicalization, etc. will provide useful tools with which to explore the nature of various kinds of predicates.

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