Motivation for Null Operator Movement in Purpose Clauses

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The aim of this thesis is to explore the way to motivate the null operator movement within the framework of Chomsky (2000). Dealing with purpose clause constructions, we will show that the value of the ϕ-set of a null operator can be specified from its antecedent through predication proposed by Williams (1980).

Furthermore, we focus on the idiosyncrasy of the construction: purpose clauses show tensed-S condition. We will demonstrate that, by using the notion of phase, a sentence which gives rise to the violation of tensed-S condition is excluded as an instance of improper movement.

1. Introduction

The aim of this paper is to present an analysis of purpose clause constructions within the framework of Chomsky (2000, 2001)[1]. Basically by adopting the analysis proposed by Browning (1987), we will show that purpose clauses are licensed by their antecedents via predication relation proposed by Williams (1980). Then we will also argue that tensed-S condition can be accounted for if purpose clauses are analyzed as involving the second type of null operator (*Top*) suggested by Authier (1989), coupled with the two assumptions; (i) an infinitival clause CP is not a phase, and (ii) the movement of *Top* operator to [Spec, $\underline{v}$P] position is driven by an EPP feature and a P-feature.

This paper is organized as follows. In section 2, we will show that predication relation plays a crucial role in licensing null operator in purpose clause constructions. Section 3 argues that purpose clauses are regarded as involving the second type of null operator. In section 4, we will try to account for the characteristic of purpose clauses under our assumptions. Section 5 is the conclusion of this paper.

2. Condition on Licensing of Purpose Clauses

The data cited below offer a condition on the antecedent of a purpose clause: the licenser of a purpose clause must be NP.

(1) a. They brought John along [OP_i [PRO to talk to t_i]].
b. I bought a book [OP_i [PRO to talk to t_i]]

If purpose clauses are licensed via predication relation, NP restriction on the antecedent of a purpose clause is reducible to that on predication.

(2) Predication
If NP and X are co-indexed, NP must c-command X or a variable bound to X in the same minimal domain.[2]
(cf. Williams (1980))

Notice that predication must be associated with θ-role assignment by a predicate to a subject. On the basis of this observation, one may suspect that we cannot associate purpose clause with predication because the antecedent and the adjunct clause in purpose clause constructions has nothing to do with θ-role assignment.

But it is exactly on the right track to think that predication relation holds without θ-role assignment between two elements. Stowell (1985) makes the following remark about the status of the null operator:

(3) The value of the set of ϕ-features contained in a null operator must be determined in some way. (Stowell 1985)

He states that the value of ϕ-set of a null operator is originally unspecified. We will assume that a ϕ-set whose value is unspecified is the uninterpretable feature. This indicates that, if the value remains unspecified, the sentence involving the null operator is excluded by the legibility conditions, which is imposed on features remaining at the interface level. If Stowell's suggestion is correct, it is reasonable to pursue a way of determining the value of the set of ϕ-features in a null operator.

Extending the analysis of Williams, Browning (1987) claims that a subject-predication relation is licensed if NP and X fulfill both a configurational condition (2), and a relational specification (4).

(4) A subject-predicate relation holds if
  a. the NP discharges the external θ-role of the X or
  b. the NP specifies the ϕ-set of a null operator in the specifier of the X.
(cf. Browning (1987))

This condition states that a predication relation holds without a θ-assignment relation between two elements if they meet the conditions of (2) and (4b).

As a concrete example of the case where a predication relation holds without θ-assignment relation, consider the following instance:

(5) I [$_{vP}$ bought a book$_i$ [$_{CP}$ OP$_i$ [PRO to read t$_i$]]].

Williams suggests that purpose clauses like the one in (5) form a predication relation. If so, it is reasonable to say that, in (5), the subject-predicate relation holds between the adjunct clause and its antecedent in the sense of Browning (1987).

Recall that, in Stowell's analysis, the value of the set of ϕ-features contained in a null operator must be determined by its antecedent. If its value is specified via predication relation by virtue of fulfillment of the condition (2) and (4b), we can say that it plays a role in syntactic component: the rule of predication is operative in narrow syntax.

3. The Idiosyncrasy of Null Operator in Purpose Clauses

It is well-known that purpose clauses exhibit the properties of canonical wh-movement.

Nevertheless, there is a different behavior between purpose clauses and other wh-movement constructions. In this construction, the gaps of the null operator cannot occur within tensed clauses.

(6)?* John bought this book for us to convince Mary that he wrote t.

The wh-extraction from tensed complements in direct questions does not show the effect, however.

(7) Who did you persuade Mary to tell John that we visited t?

The sentence (7) is acceptable although the empty category of the overt operator sits in the tensed clause. Then, how can we account for the unexpected deviance of the sentence in (6)?

Authier (1989) proposes that there exist two types of empty operator that do not alternate with overt wh-phrases. He points out that wh-extraction of an overt operator out of a clause containing the null operator yields a licit sentence. This is unpredictable if the null operator shares the same landing site as that of overt wh-phrase. See the sentences in (8).

(8) a. Which car$_i$ did she buy those whitewalls$_k$ [OP$_k$ PRO to put t$_k$ on t$_i$]?
  b. Who$_i$ did she get it$_k$ out [OP$_k$ PRO to show t$_k$ to t$_i$]?

If the null operator occupied the specifier position of CP, we would expect the instances in (8) to be illegitimate sentences because of the violation of wh-island conditions, as in (9):

(9) a.* Which car$_i$ did she know [what$_k$ to put t$_k$ on t$_i$]?
  b.* Who$_i$ does she wonder [what$_k$ to show t$_k$ to t$_i$]?

In (9), overt wh-phrase is extracted over another overt wh-phrase sitting the [Spec, CP] position in the infinitival clause. If the position where the null operator occurs is equivalent to that in

which the overt wh-phrase sits, how can we account for the grammatical contrast between (8) and (9)?

Authier assumes that the null operator in (8) does not take specifier of CP as its landing site; instead, it adjoins to TP. This means that two types of empty operators exist in English. According to his analysis, the first type of null operator (*OP*) occurs in the [Spec, CP] position, whereas the second type of null operator, which we will call *Top* operator (*Top*), sits in the TP position.

Given his analysis, the structures of (8) are represented in (10).

(10) a. Which car$_i$ did she buy those white-walls$_k$ [$_{CP}$ [$_{TP}$ Top$_k$ [$_{TP}$PRO to put t$_k$ on t$_i$]]]?
b. Who$_i$ did she get it$_k$ out [$_{CP}$ [$_{TP}$ Top$_k$ [$_{TP}$PRO to show t$_k$ to t$_i$]]]?

In these structures, the embedded [Spec, CP] position in purpose clauses is free, which allows the overt wh-operator to move successive cyclically to the matrix clause without violating subjacency condition.

Given his analysis, the null operator of OPCs belongs to the second type of null operator; it moves to [Spec, TP] position. What triggers the movement of the second type of null operator (*Top*)? We will assume that EPP feature of T attracts the null operator (*Top*) of OPCs; in other words, *Top* operator movement is triggered by an EPP feature.

4. An Analysis of Purpose Clause Constructions

4.1. *Determination of the Value of the Null Operator*

In this subsection, we will see how the null operator of a purpose clause is associated with its antecedent via predication. Consider the example of (11).

(11) I bought a book to read.

Chomsky (2000, 2001) introduces the notion of phase, which is crucial in our analysis. Given that an adjunct clause is regarded as a phase, the structures in (11) at each phase level correspond to those of (12):[3]

(12) i. P1 = [$_{CP}$ TOP$_i$ [$_{TP}$ t'$_i$ [$_{TP}$ PRO to read t$_i$]]]
ii. P2 = [$_{vP}$ I [$_{v'}$ bought a book]]

In the case of the structure (12i), *Top* first moves to the [Spec, TP] position. This movement is A-movement triggered by the EPP feature on the head of TP. The second movement of the operator is induced by the requirement of the checking of the P-feature on the head of CP. This indicates that the second movement of *Top* undergoes A'-movement.

Then, P1 adjoins to P2 by Pair-Merge (adjunction). If we adopt VP-shell proposed by Larson (1988), this operation yields the structure (13):

(13) I [$_{vP}$ bought a book$_i$ [$_{CP}$ TOP$_i$ [$_{TP}$ t'$_i$ [$_{TP}$ PRO to read t$_i$]]]]

Recall that we must satisfy the following conditions for the null operator (*Top*) to associate with its antecedent.

(14) Predication
If NP and X are co-indexed, NP must c-command X or a variable bound to X in the same minimal domain.
(cf. Williams (1980))

(15) A subject-predicate relation holds if
a. the NP discharges the external θ-role of the X or
b. the NP specifies the ϕ-set of a null operator in the specifier of the X.
(cf. Browning (1987))

If predication relation did not hold between the operator and its antecedent, the antecedent would fail to determine the value of ϕ-sets of the operator, so that the derivation would violate legibility conditions.

In this configuration, (13) satisfies the predication relation (14): *a book* c-commands the null operator (*Top*), and they occur in the same minimal domain of VP. Furthermore, the null operator is in situation of receiving the value of the ϕ-set from its antecedent via predication relation. This relation between the null operator and its antecedent fulfills the requirement of (15b). Accordingly, the antecedent sets the value of the ϕ-set of the null operator (*Top*), so that the derivation of (13) converges. Thus, predication relation is operative in the case of the specification of the ϕ-set of the null operator (*Top*) in purpose clauses.

To summarize, in purpose clause constructions, we will postulate the following conditions.

(16) a. The value of the ϕ-set of the null operator must be determined by its antecedent via predication at the VP level; otherwise the derivation crashes by virtue of the violation of legibility conditions.
b. Purpose clauses (OPCs) are analyzed as involving the second type of null operator (*Top*), which is triggered by an EPP feature.

4.2. *Deriving Characteristic of Purpose Clause Constructions*

In the previous subsection, we have shown that purpose clauses (OPCs) are regarded as involving the second type of null operator (*Top*), which moves to [Spec, TP] position to check the EPP feature of T. Thus, we have distinguished it from the first type of null operator (*OP*). In this subsection, we will try to account for some interesting property of purpose clause constructions in our analysis. Consider the instances of (17).

(17) a.? John bought it [to try [to convince Bill [to play with]]]
b.* John proved the theorem [to show [that he understood completely]]
c.* I brought it along [to say [that I've read]]

As we have seen in section 3, in purpose clause constructions, the trace of an operator cannot sit in tensed clauses, which is called tensed-S condition. The illegitimacy of the sentences in (17b) and (17c) is attributed to the violation of the condition: the empty category is inside the tensed clause.

In order to account for the grammatical contrast between (17a) and (17b,c), we will introduce two assumptions; (i) an infinitival clause CP is not a phase, and (ii) the raising of *Top* operator to [Spec, $\underline{v}$P] position is driven by an EPP feature and a P-feature, so that this movement yields the status of both A-movement and A'-movement.

With these assumptions in mind, we will account for the contrast. (18) and (19) correspond to the structure of the (17a) and (17b), respectively.

(18) John bought it [$_{CP}$ TOP [$_{TP}$ t_1 [$_{TP}$ PRO to t_2 try [$_{CP}$ t_3 PRO to convince Bill [to play with t_4]]]]] (=(17a))
(19) John proved the theorem [$_{CP}$ TOP [$_{TP}$ t_1 [$_{TP}$ PRO to t_2 show [$_{CP}$ t_3 that [$_{TP}$$t_4$ he understood t_5 completely]]]]] (=(17b))

The illegitimacy of (19) is attributed to the chain, which the movement creates. The operator (*Top*) moves to the [Spec, TP] position (t_4), and then raises to the [Spec, CP] position (t_3). The former is driven by an EPP feature (A-movement); on the other hand, the latter is triggered by a P-feature (A'-movement). The next movement of *Top* is the movement to the [Spec, $\underline{v}$P] position (t_2), and then raises to the higher TP position (t_1).[4] A series of derivation creates an improper chain of the form A-A'-A'-A, because the landing site of *Top* to TP, by assumption, is an A-position. In other words, *Top* drops in at the embedded [Spec, CP] position on the way to the higher [Spec, TP] position, so that the derivation forms an improper chain. Hence, the derivation of (19) is ruled out.

On the other hand, in the case of (18), the derivation need not raise to the [Spec, CP] position as an intermediate step since, by assumption, an infinitival clause CP is not a phase. This indicates that *Top* directly moves from TP to the higher [Spec, $\underline{v}$P] position. Then, when we consider the derivation of *Top* from the embedded TP (t_3) to the higher TP (t_1) position, the derivation creates a chain of the form A-A-A. Accordingly, the movement of (18) does not create an improper movement, so that the derivation converges.

The main idea is that, if a derivation is forced to move to the [Spec, CP] position, then it is excluded as an instance of an improper movement. If this approach is on the right track, it is valid to suppose that an infinitival clause CP is not a phase.

5. Conclusion

In this paper, we have attempted to offer an analysis to account for determining the value of the ϕ-set of the empty operator contained in purpose clause constructions. If an empty operator in OPCs does not have its ϕ-set specified by the antecedent in the sense of Stowell (1985), the sentence is excluded by the violation of legibility conditions. In so doing, we crucially adopted the predication developed by Williams (1980) and the framework of Chomsky (2000, 2001).

It was also shown that tensed-S condition can be accounted for if purpose clauses (OPCs) are analyzed as involving the second type of null operator (*Top*), coupled with two assumptions; (i) an infinitival clause CP is not a phase, and (ii) the movement of *Top* operator to [Spec, v P] position is driven by an EPP feature and a P-feature. We have argued that the derivation forced to move to the [Spec, CP] position causes an improper movement.

Notes

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[1]Note that, through this article, we will restrict attention to the case of Object-gap purpose clauses (OPCs) since, according to Browning (1987), only OPCs obligatorily involve the raising of the null operator.

[2]The definition of the minimal domain is characterized as follows:

(i) Minimal domain

The minimal domain of a head H is the set of terms immediately contained in projections of H.

As for the definition of immediate containment, see Chomsky (2000).

[3]In Chomsky (2001), an adjunct clause is thought of as a weak phase, which is irrelevant to our analysis.

[4]We will assume that, in the case of the movement of *Top* to the [Spec, vP] position, it is optionally selected whether the movement is A-movement or A'-movement.

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