

An RCS Approach to RTO Construction and Object Control Verbs*

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1. Introduction

In some models of transformational grammar, a transformation called 'raising-to-object' (henceforth RTO) has been recognized as an established NP movement device. The RTO applies to a double clause structure and the subject of the complement clause gets raised to the object position of the main clause as a result. This process is exemplified below.

(1)

a. Mike believed [_S[_{NP} Chomsky] to be a fanatic madonnawannabe]
└──────────┘ RTO

b. Mike believed [_{NP} Chomsky] [_Sto be a fanatic madonnawannabe]

The RTO raises at least three problems: (i) The setting up of a D-structure such as (1a) and the NP movement transformation are unjustified since the inventions have been constructed on tenuous grounds, (ii) The RTO leads to a violation of the Projection Principle, and (iii) The RTO gives rise to a θ -criterion violation.

The purpose of this essay is three-fold. First, the problems associated with the RTO are pinpointed and discussed in detail. Next, as an alternative to the RTO analysis a lexically based account is advanced in the spirit of a recursive categorical syntax (hereafter RCS) approach. Finally, straightforward lexical specifications are put forward to account for a fundamental, indispensable and universal property shared by a class of 'object control' verbs: the verbs are subcategorized to select an object and complement infinitive clause, and the object of the verb

functions as the agent of the complement clause.

2. Problems

Let us first consider the first problem with respect to motivation for the RTO. Judging from the derivation in (1), we expect the RTO to be obligatory. This seems to be the case since if the RTO has not applied to (1a) an undesirable, ungrammatical S-structure would surface as a result.¹

(2)

a. Mike believed [_S[_{NP} Chomsky]to be a fanatic madonnawannabe]

└──────────┘ RTO not applied

b. Mike believed [_S Chomsky to be a fanatic madonnawannabe]

Thus, in order to obtain the desired outcome, the RTO has to apply invariably. But, this immediately raises a question: Is there a sound reason (motivation) why the RTO must be an obligatory rule? The sole purpose of forging the rule seems to be only to justify an NP preposing transformation, thereby moving the subject of the lower clause to the object position of the higher clause. If this is the case, then the RTO should be considered an artifice offering no true generalization, and the significance of the device loses its weight. In Newmeyer (1980), Postal's argument for the RTO is cited as representative. The gist of the argument is as follows: Heavy-NP-Shift which applies to objects but not subjects makes an NP movable as pictured in (3). Therefore, a rule of raising to object that transforms (4a) into (4b) must exist.

(3)

a. I believe [_{NP} all of the gang members who were caught] to have been innocent.

b. I believe to have been innocent [_{NP} all of the gang members who were caught].

(4)

a. John believed [_S Bill (to have) left]

b. John believed Bill [_S to have left]

The above argument for the RTO, however, does not hold water. As

the examples given under (5)-(7) substantiate, Heavy-NP-Shift transforms well formed sentences into ill-formed ones.

(5)

- a. She asked a man who was near the window whether it looked like rain.
- b. *She asked whether it looked like rain a man who was near the window.

(Ross, 1967)

(6)

- a. I forced all the children who were swimming to eat hot soup.
- b. *I forced to eat hot soup all the children who were swimming.

(Emonds, 1976)

(7)

- a. The IRS sent the recently elected President an invitation to an audit.
- b. *The IRS sent an invitation to an audit the recently elected President.

(Culicover and Wexler, 1977)

Let us now add two couples of crucial examples to clinch the argument.

(8)

- a. I believed the children who were eating my sashimi to have been in trouble.
- b. *I believed to have been in trouble the children who were eating my sashimi.

(9)

- a. John believed the man who made a joke in Greek to have missed the point.
- b. *John believed to have missed the point the man who made a joke in Greek.

The above examples show that Heavy-NP-Shift for objects does not always produce a desired result; thus it does not serve as an appropriate tool for testing and justifying the existence of the alleged RTO.

Based on the latest developments of transformational grammar, however, one might produce an argument for the RTO to the effect that *Bill* in (4a) has to move in order to receive Case, hence satisfying the

requirement of the Case Filter.

(10) Case Filter

*NP, where NP has a phonetic content and has no Case.

(Chomsky, 1981:49)

Looking at the issue from this angle, consider now the following examples.

(11)

a. For Mary to be intelligent (is unbelievable).

b. *Mary to be intelligent (is unbelievable).

In (11a), *Mary* is assigned Accusative case by the preceding complementizer *for*, a case assigner², while in (11b) *Mary* is left Caseless since no case assigner is present in the structure. This explanation, however, does not constitute an argument for the RTO analysis. The above examples rather serve as a piece of evidence against the transformationalist's reasoning. Looking at the issue very closely, we see that the whole heart of the matter boils down to the point that Bill should have been where it belongs in the first place, i.e. the object position of the higher clause instead of the subject position of the lower clause. This view points towards a straightforward and natural explanation for the reason why (12a) is well-formed, whereas (12b) is not.

(12)

a. To be intelligent (is fascinating).

b. *Mary to be intelligent (is fascinating).

As evinced by (12a), a *to*-infinitive clause is a single whole, and hence can stand by itself. This explains why the presence of a lexical NP in the subject position of an infinitive clause gives rise to anomaly as substantiated by (12b). What does this amount to? In effect, the setting up of a D-structure such as (4a) creates more problems rather than providing a viable solution. Why set up an unmotivated, ungrammatical D-structure to salvage the movement transformation, when there seems to be a perfect solution consonant with the subcategorization frame? This approach confirms the aptness of the traditional point of view that *believe*-type verbs are subcategorized to select an object which can be

optionally followed by an infinitive clause. The conception spelled out here is borne out by examples such as those given below.

(13)

- a. I believe her.
- b. I believe her to be intelligent.

Thus the arguments developed so far seems to substantiate the point of view that verbs such as *believe*, *prove*, *feel*, *hear*, *make*, *let*, *have*, etc. can take an object which may be followed by a complement infinitive clause. In addition to this subcategorization frame, there is a semantic property which is assumed to be universal and shared by all of the verbs in question: the object of the verb serves as the agent of the complement clause. This issue will be taken up and developed in section 3 of this article.

The second major problem associated with the RTO is that it gives rise to a violation of a constraint on theta marking.

(14) Theta Criterion

Each Argument bears one and only one θ -role, and each θ -role is associated to one and only one Argument.

(Chomsky, 1981:36)

Bearing this constraint in mind, let us reexamine the examples in (4), where the NP, *Bill*, which was the subject of the complement clause, has been moved to the object position of the main clause. If this is the case, we might expect that *Bill* was first assigned the θ -role AGENT in (4a), and then received the θ -role THEME as a result of the RTO application. This means that *Bill* would carry two different θ -roles, hence violating the Theta Criterion.

The third major problem with the RTO is that it eventually leads to a violation of the Projection Principle (15).

(15) Projection Principle

Syntactic representations [i.e. syntactic structures] must be projected from the Lexicon, in that they observe the subcategorization properties of lexical items.

(Chomsky, 1981:29)

The Projection Principle in effect entails that the subcategorization properties of lexical items must be satisfied not only at D-structure, but also at S-structure (and arguably at all intermediate stages of derivations as well. (Radford, 1988:548)). With this in mind consider now the following D-structure and S-structure representations.

(16)

- a. Sosen believed [_S[_{NP} the universe]to be an everlasting, self-sufficient
└──────────┘ RTO
 structure]
- b. Sosen believed [_{NP} the universe] [_Sto be an everlasting, self-sufficient
 structure]

Apparently, there has been a drastic change in the subcategorization frame of the verb *believe*. The RTO has transformed the subcategorization frame of the verb *believe*, V:___ [_S] into *believe*, V:___ NP [_S]. What we see here is a clear-cut example of the violation of the Projection Principle.

At this point one might suggest an alternative analysis where verbs such as *believe*, *prove*, etc. are subcategorized to select an object and S as shown in (17)³. This idea makes D-structure representations such as (1a), (4a), (16a), and the RTO transformation altogether superfluous.

(17)

- a. believe, V:___ NP [_S]
- b. prove, V:___ NP [_S]

The alternative analysis suggested above ultimately points towards a lexically based, nontransformational analysis. Let us now shift our attention and focus on an RCS approach. It will be shown that, given lexical specifications of relevant lexical items and Word Induction, we can account for the RTO construction straightforwardly without resorting to the subject NP movement. Moreover, lexical specifications provide a formal means to account for the semantic property shared by all of the object control verbs: the object of the verbs plays the role of agent of the complement clause right at the onset of generating the construction within the Lexicon.

3. An RCS approach

In what follows I assume the theory of RCS originated and developed by Brame (1984; 1985; 1987; 1988). A detailed exposition of the theory is not the purpose of the present paper, nor is it possible on account of limited space. For expository purposes, however, it is necessary to give a brief sketch of the basic mechanism.

The RCS includes, among others mechanisms, two formal devices: lexical specification and Word Induction. The lexical specification rigorously itemizes information on grammatical relations which are taken to be encoded in lexical items. Words can be classified into two major groups, those which take arguments and those which do not, called nullary words. Argument-taker words are further classified into three groups: l-words, d-words, and dl-words. The four formulae given below cover the subcategorization frames of all the types of words discussed above.

(18)

- | | |
|---|---------------|
| a. $ x, \varphi $ | nullary words |
| b. $ x, \varphi \psi_1, \dots, \psi_n\rangle$ | l-words |
| c. $\langle \theta_m, \dots, \theta_1 x, \varphi $ | d-words |
| d. $\langle \theta_m, \dots, \theta_1 x, \varphi \psi_1, \dots, \psi_n \rangle$ | dl-words |

(cf. Brame, 1987: 151)

The lower case Latin in the formulae designates phonetic or orthographic words such as *universe*, *saw*, *the*, *linguist*, etc.. The lower case Greek represents categories such as D, determiner; N, noun; V, verb; P, preposition; T, tense; etc..

Word Induction is a concatenation device which mechanically unites words; hence words, phrases, clauses, and sentences can be induced as a result. In Brame (1987:165), l-Induction, a left-to-right concatenator and d-Induction, a right-to-left concatenator are collapsed into one generalized mechanism called dl-Induction.

(19) dl-Induction

- If $L_i = \langle \alpha_i, \dots, \alpha_1 | x \varphi | \psi_1, \dots, \psi_n \rangle \in \text{LEX}$ and
 $L_j = \langle \delta_i, \dots, \delta_1 | y \sigma | \beta_1, \dots, \beta_j \rangle \in \text{LEX}$ and

$$L_k = \langle \epsilon_m, \dots, \epsilon_1 | z, \theta \alpha_1 | \gamma_1, \dots, \gamma_k \rangle \in \text{LEX}, \text{ then}$$

$$(L_k)L_i(L_j) = \langle \delta_1, \dots, \delta_1, \alpha_1, \dots, \alpha_2, \epsilon_m, \dots, \epsilon_1 | z^{-x-y}, \theta \alpha_1 \sigma \psi_1 \sigma | \beta_1, \dots, \beta_j, \psi_2, \dots, \psi_n, \gamma_1, \dots, \gamma_k \rangle \in \text{LEX}.$$

Let us take a left-to-right concatenation as example. 1-Induction as well as d-Induction connects words together if the argument category of a lexical item is the same type as the initial element of the intrinsic category of another lexical item. This can be illustrated as in (20), where the association line is added to show that the categories indicated by the arrow heads are the same type.

(20)

$$|x, \varphi | \underbrace{\psi_1, \dots, \psi_n}_{\uparrow} \rangle (|y, \psi_1 \sigma | \beta_1, \dots, \beta_j \rangle) = |x-y, \varphi \psi_1 \sigma | \beta_1, \dots, \beta_j, \psi_2, \dots, \psi_n \rangle$$

Let us now provide a concrete example to complete the picture. Given the lexical specifications in (21) and 1-Induction (20), the induced word on the right of the equal sign in (22) can be obtained.

(21)

- a. |the, D_n|_nN_n >
- b. |linguist, 3N|

(22)

$$|the, D_n|_n N_n \rangle (|linguist, 3N|) = |the-linguist, D33N|$$

The subscript n of D and N in (21a) is designed to show that the number agreement relation exists between the determiner and noun.

The induced word *the-linguist* in (22) as it stands does not function as a subject yet. In order to make it a subject, we need a device which we call subject identity word. Upon concatenation, this phonetically null item gives a word power to play the role of subject. (In English, words such as *I, we, he, she, they* etc. are intrinsically subjects; hence they are not subject to subjectivization involving the subject identity word.)

(23) Subject Identity Word

$$|A, \$|D_n, VT^x_n \rangle$$

The symbol \$ designates subject type. The superscript x of T is a variable and it ranges over °, present; and ¯, past. Let us show how the Subject Identity Word works.

(24)

$$|A, \S[D_n, VT^{\times}_n \rangle (|the-linguist, \S D33N|) = |the-linguist, \S D33N| VT^{\times}_3 \rangle$$

The induced word on the right of the equal sign is now a subject that selects a verb with tense as its argument. Moreover, number agreement between the subject and the verb it selects is guaranteed by the coindexing through the subscript n of D and T . As shown above, number agreement has been actualized by the third person symbol 3 of D , N , and T .

We are now in a position to see how so-called RTO constructions such as *The linguist believed the theory to be fallacious* can be generated. First, however, lexical specification of the relevant items is in order.

(25)

a. $|believed, VT^{-3}| c, T \rangle^t$ b. $|A, c |D \rangle$ c. $|the-theory, D33N|$ d. $|to, T| VT^{\times} \rangle$ e. $|be, VT^{\times}| A \rangle$ f. $|fallacious, A|$

The intrinsic category VT^{-3} of *believed* shows that it is a third person verb with past tense. Furthermore, the argument category of *believed* demonstrates that it selects two arguments: c , Case type of objects and T . The superscript ∞ of T in (25d) and (25e) depicts infinitive tense. Given the above lexical specifications together with the induced word in (24) and I-Induction (20), the target sentence mentioned above can be created as desired.

(26)

$$a. |the-linguist, \S D33N, VT^{\times}_3 \rangle (|believed, VT^{-3}| c, T \rangle) = the-linguist-
believed. \S D33N VT^{-3}| c, T \rangle$$

$$b. |A, c |D \rangle (|the-theory, D33N|) = |the-theory, c D33N|$$

$$c. |the-linguist-believed, \S D33N VT^{-3}| c, T \rangle (|the-theory, c D33N|) \\ = |the-linguist-believed-the-theory, \S D33N VT^{-3} c D33N| T \rangle$$

$$d. |the-linguist-believed-the-theory, \S D33N VT^{-3} c D33N| T \rangle \\ (|to, T| VT^{\times} \rangle) = |the-linguist-believed-the-theory-to, \S D33N$$

VT⁻³ c D33NT[VT^{*}>

e. |the-linguist-believed-the-theory-to, SD33NVT⁻³ c D33NT[VT^{*}>
 (|be, VT^{*}[A>)=|the-linguist-believed-the-theory-to-be.SD33N
 VT⁻³ c D33NTVT^{*}[A>

f. |the-linguist-believed-the-theory-to-be.SD33NVT⁻³ c D33NT
 VT^{*}[A>(|fallacious, A)=|the-linguist-believed-the-theory-to-be-
 fallacious,SD33NVT⁻³ c D33NTVT^{*}A|

The above derivation is sufficient to show that so-called RTO constructions can be accounted for straightforwardly and mechanically without assuming the RTO.

In connection with the discussion of the RTO given so far, let us now consider the following chart of related verbs.

(27)

Object Control Verbs		
	Perception Verbs	Causative Verbs
believe	see	let
prove	watch	make
advise	hear	bid
.	feel	have
.	.	.
.	.	.
.	.	.

The verbs in the chart are subcategorized to occur with an object which can be followed by either a *to*-infinitive clause or a bare infinitive clause. Most important of all, though, is that they are all classified into a set of object control verbs. All of the verbs in the set select an object which plays the role of agent (subject) of the complement infinitive clause of the RTO construction. This semantic property, which is assumed to be universal, can be accounted for with two lexical specifications in generalized formulae pictured below.

(28)

a. $|x, V|_{\alpha} c^{ag, \alpha} T >$ b. $|y, V|_{\alpha} c^{ag, \alpha} T^{\infty} >$

The lower case Latin designates phonetic or orthographic words such as *believe*, *see*, etc.. The superscript *ag* of *c*, shows that the object argument is agentive. The coindexing employed here in terms of the subscript α is designed to express the semantic characteristic of the agent-predicate agreement relation which exists between the object of the object control verbs and the complement infinitive clause. The only difference between (28a) and (28b) is that the former selects a *to*-infinitive clause as its argument, while the latter takes a bare infinitive clause. In line with the above developments, (25a) is now replaced with (29), and the derivation in (26) should be modified accordingly if we wish to obtain a more refined analysis of the issue under consideration.

(29)

|believed, VT⁻³| _{α} c^{ag, α} T >

Our RCS approach offers a straightforward means for accounting for so-called RTO constructions together with object control verbs. Furthermore, the alternative analysis advanced in this article has at least three advantages over the previous transformational RTO analysis. First, the lexical specification for the object control verbs formally specifies the choice of arguments once and for all; hence a generalization is obtained. Second, the lexical specification advanced in this essay captures another important generalization of the universal quality that the object of the object control verb acts as the agent of the object control predicate. Finally, no ad hoc devices, principles, or constraints are necessary to account formally for RTO constructions and object control verbs. Well-motivated lexical specifications and Word Induction suffice to induce so-called RTO constructions. Further, these two *formal devices enable us to capture a generalization in describing a competent speaker's knowledge with reference to the semantic property involving the relation between the object of the main clause and the complement clause of so-called RTO constructions.*

4. Concluding Remarks

The previous RTO analysis was rejected on the basis of three counter-arguments: (i) no sound motivation has been offered for either the setting up of the D-structure representation or the RTO transformation; (ii) no clear explanation has been given for the violation of the Projection Principle, and (iii) the RTO gives rise to a θ -criterion violation. As a competing analysis, a lexically based RCS account has been advanced. The alternative analysis claims to offer three advantages over the previous RTO analysis. First, so-called RTO constructions can be generated in a straightforward and mechanical fashion: given well-motivated lexical specifications and Word Induction. Next, a generalization has emerged as a consequence of the lexical specification: for the object control verbs: (i) the subcategorization frame of the double argument structure of object control verbs is specified uniformly; hence a generalization has been obtained, and (ii) the semantic characteristic peculiar to the object control verbs is encoded in the lexical specification; thus one instance of a linguistic universal is expressed in terms of formal lexical specification. Finally, the lexical specification together with Word Induction supersedes and annuls transformational devices, principles and constraints alike.

FOOTNTES

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1. (2b) might be thought of as a grammatical S-structure if it is regarded as an "exceptional Case-marking" construction (see Chomsky, 1981 : 66; Stowell, 1981 : sec. 6; Lasnik and Saito, 1984: sec.5.3). Under the exceptional Case-marking assumption, *believe* in (2b) assigns Accusative case to *Chomsky* in the S since the former verb governs the latter NP. Although this assumption frees (2b) from the Case Filter (see p.4 of this article), it arouses a question in ones mind: why should

Chomsky be assigned Accusative case despite the fact that it is the subject of the complement clause? If it is the subject, then shouldn't it be assigned Nominative case instead?

2. See Chomsky and Lasnik (1977 : 459), Chomsky, (1980 : 30–31) and Rouveret and Vergnaud (1980 : 170) for the assumption that the complementizer *for* is a case assigner. Under this assumption, however, the specifier/subject of the *to*-infinitive clause in (11a) is assigned "Accusative case". Alternatively, the *for* in question can be thought of as a kind of preposition which, like other prepositions, assigns Accusative case to its object. This merely offers a partial solution. The heart of the above sphinx question remains unanswered : what is the reason behind the execution of the case assignment in which the subject is assigned Accusative case instead of Nominative case?
3. The four sentences given below under (i) call for the additional specifications as shown in (ii).

- (i) a. I believe him/that.
 b. I believe that John is innocent.
 c. The evidence proved his guilt.
 d. The evidence proved that he was innocent.

- (ii) a. believe, V: NP
 b. believe, V: [\bar{s}]
 c. prove, V: NP
 d. prove, V: [\bar{s}]

4. *Believe*-type verbs, however, can select an object or a *that*-clause as illustrated below.

- (i) The linguist believed Chomsky's hypothesis.

- (ii) The physicist believed that Chomsky was a fanatic phonetician.

This motivates the addition of two lexical specifications given below, where *x* symbolizes *believe*-type verbs and *C^p* designates the *that*-complementizer.

- (iii) $\{x.TV^{-3}\}c >$

- (iv) $\{x.TV^{-3}\}C^p >$

Furthermore, in English, *believe*-type verbs are subcategorized to

select an object which can be optionally followed by a *to*-infinitive clause or an adjective as shown below.

- (i) a. I believe Mary to be intelligent.
- b. I believe Mary intelligent.

In French and Italian, however, the presence of an infinitive clause gives rise to an ungrammatical string of words as pictured below. (The French and Italian examples are taken from Tanaka (1992)).

- (ii) French
 - a. *Je croyais Marie être intelligent.
 - 'I believe Mary to be intelligent.'
 - b. Je croyais Marie intelligent.
 - 'I believe Mary intelligent.'

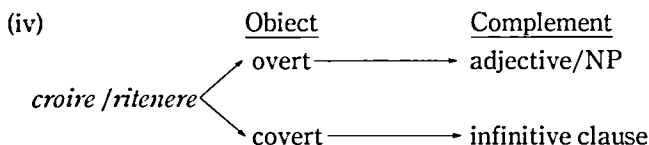
Italian

- a. *Io ritenevo Mary essere intelligente.
- 'I believe Mary to be intelligent.'
- b. Io ritenevo Mary essere intelligente.
- 'I believe Mary intelligent.'

Surprisingly, there are instances where French *croire* and Italian *ritenere* occur with an infinitive clause as exemplified below.

- (iii) a. l'homme que je croyais être intelligent (French)
- 'the man who I believe to be intelligent'
- b. l'uomo che ritenevo essere intelligente (Italian)

Notice that the overt (phonetically non-null) object NP is not placed at the right of French *croyais* in (iii a) or Italian *ritenevo* in (iii b), respectively. The object of those verbs is materialized as the antecedent of the relative pronoun in both languages. Based on the above examples, we may venture a hypothesis that *croire* and *ritenere* are subcategorized to take (i) an overt object NP which may be followed by an adjective/NP or (ii) a phonetically null covert object NP, which is associated with the antecedent of a relative pronoun, and an infinitive clause. Thus, we have an instance of complementary distribution regarding the object control verbs and their argument structure as shown in the following diagram.



The above hypothesis might appear to capture mere descriptive accuracy. However, there is more to it. *Believe*-type verbs in English, French, and Italian are all subcategorized to select an object which can be followed by an adjective/NP or an infinitive clause. What is significant here is that this subcategorization frame and the semantic property peculiar to the verbs at issue can be accounted for uniformly in terms of the lexical specification advanced in section 3 in this article, thereby capturing a cross-linguistic generalization.

REFERENCES

- Brame, M. 1984. "Recursive Categorical Syntax and Morphology," *Linguistic Analysis* 14, 4:265-287.
- _____. 1985. "Recursive Categorical Syntax II : n-arity and variable continuation," *Linguistic Analysis* 15.2:137-17.
- _____. 1987. "Recursive Categorical Syntax III : d-Words, l-Words, and dl-Induction." *Linguistic Analysis* 17, 3-4:147-185.
- _____. 1988. "On the Nature of Cancellation," *Linguistic Analysis* 18, 3-4:182-193.
- Chomsky, N. 1980. "On binding," *Linguistic Inquiry* 11:1-46.
- _____. 1981. *Lectures on government and binding*. Dordrecht: Foris.
- Chomsky, N. and H.Lasnik. 1977. "Filters and Control," *Linguistic Inquiry* 8:425-501.
- Culicover, P.W. and K. Wexler. 1977. "Some syntactic implications of a theory of language learnability," in Culicover, P.W., T. Wasow and A. Akmajian(eds.). 1977. *Formal Syntax*. New York: Academic Press.
- Emonds, J.E. 1976. *A Transformational Approach to English Syntax: Root, Structure-Preserving and Local Transformations*. New York: Academic Press.
- Lasnik, H. and M.Saito. 1984. "On the nature of proper government,"

- Linguistic Inquiry* 15:235-89. Newmeyer, F.1980. *Linguistic theory in America*. New York: Academic Press.
- Newmeyer, F. 1980. *Linguistic theory in America*. New York: Academic Press..
- Postal, Paul. 1974. *On raising*. Cambridge, Massachusetts: MIT Press.
- Radford, A. 1988. *Transformational grammar*. Cambridge University Press.
- Ross, J.R. 1967. *Constraints on Variables in Syntax*. Ph.D. dissertation. MIT.
- Rouveret, A. and J.R. Vergnaud. 1980. "Specifying reference to the subject: French causatives and conditions on representations," *Linguistic Inquiry* 11:97-202.
- Stowell, T. 1981. "Origins of Phrase Structure," unpublished Ph. D dissertation, MIT Cambridge, Mass.
- Tanaka, Hidekazu. 1992. "Raising to Object in English, French, and Japanese," *English Linguistics* 9:39-60.