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The Route that Children Take to Retreat from Overgeneration
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1. Introduction

Retreatment from overgeneration has received much attention in recent years in the study of language acquisition. One hypothesis, suggested in Baker (1979) and Pinker (1989), is that Universal Grammar (UG) simply does not make available to the learners rules that make them retreat from overgeneration, but lexical rules, according to Baker (1979), or the knowledge of semantics, according to Pinker (1989), rather play some important roles. Another hypothesis says that overgeneration pattern, traditionally taken as strong evidence for the application of explicit linguistic rules, are clearly simulated by network using a single learning mechanism that does not resort from procedural rules. A pioneering work using neural network modeling to study the overgeneration is found in Rumelhart and McClelland's (1986) simulation of the acquisition of English inflectional morphology. According to this hypothesis, the retreatment from overgeneration is also achieved by the simulation network.

This paper, as opposed to such a lexically/semantically-based learnability hypothesis and Parallel Distributed Processing (PDP) model-based hypothesis, argues that there are cases that children's grammatical assessment of particular syntactic principles triggers the retreatment from overgenerations. In particular, I present evidence that the Empty Category Principle (ECP) can work as a trigger for retreatment from an overgeneration in noun phrases, based on acquisition studies with Japanese speaking children.

2. Overgeneration

Harada (1980), Clancy (1985) and myself (1990, 1991a), among others, present some data of overgeneration that children produce in Japanese. Interestingly enough, it has been also found in Kin (1982), Lee (1991), and Lust (1992) that Korean-speaking children and Tamil-speaking children also make exactly the same type of overgeneration in noun phrases. The overgeneration pattern is illustrated in (1).

- (1) a. [R_{el} C_i aoi] no buubuu
blue (+present) *NO car
(the blue car) (Clancy, 1985)
- b. [R_{el} C_i usachan-ga tabeta] no ninzin
rabbit -NOM ate *NO carrot
(the carrot that the rabbit ate) (Harada, 1980)
- c. [R_{el} C_i tigau] no outi
different *NO house
(the different house) (Emi, 3;0)
- d. [R_{el} C_i gohan tabeteru] no butasan
food is-eating *NO piggy
(the piggy that is eating the food) (Nagisa, 3;2)

Japanese speaking children, at around 2-3 years old of age, incorrectly insert "no" after prenominal sentential modifiers and produce forms like (1). Before discussing the learnability problem regarding the overgeneration of "no" in (1), the categorial status of the overgenerated "no" in question should be considered.

Compare the paradigm in (2) with (1). In Japanese, the genitive Case marker "no" appears after NP and PP prenominal modifiers, but not after CPs (relative clauses). In various syntactic analyses of these structures, a "no"-insertion operation is proposed to insert "no" in the appropriate structural positions (Saito (1982), Fukui (1986)).

- (2) a. [N_F [N_F Yamada]-no hon]
GEN book
(Yamada's book)
- b. [N_F [P_P koko kara]-no miti]
here from GEN road
(the road from here)
- c. [N_F [R_{el} C_i Yamada-ga kaita] (*no) hon]
-NOM wrote (*GEN) book
(the book that Yamada wrote)

Besides the "no" as the genitive Case marker, there are two other kinds of "no". They are of the categories N and C. The "no" as N appears as the so-called pronoun "no" in (3a) and as the nominalizer "no" in (3b).

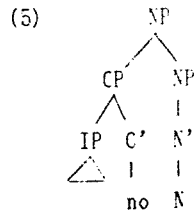
- (3) a. [NP akai no]
 red one
 (the red one)
 b. [NP[_{IF} PRO tabesugiru] no]-wa yokunai
 eat too much -TOP is-not good
 (It is not good to eat too much.)

The "no" as complementizer appears in cleft sentences, as shown in (4).

- (4) [CP [IP doroboo-ga kane -o nusunda] no]-wa koko kara da
 robber -NOM money-ACC stole -TOP here from is
 (It is from here that the robber stole the money.)

Given that there are three kinds of "no" in Japanese adult grammar (see Murasugi (1991a)), a question arises as to what that over-generated "no" in (1) is.

Here, Murasugi (1990, 1991a) and Lee (1991) argue that the overgenerated item is complementizer, and those children at the stage of overgeneration have the CP relative clause structure in mind, incorrectly lexicalizing the complementizer "no" in (1). Given this hypothesis, the structure of relative clauses conjectured by the children at this stage is as in (5).



Note that this structure is identical to the one assumed for English relative clauses, aside from the linear order of constituents.

While no lexical complementizer appears in relative clauses in the adult grammar, some children do lexically realize the head C as "no". This could be done on the basis of their knowledge that the position C exists as the head position of a CP. The evidence which can be assumed to trigger this overgeneration of "no" is that C is realized as "no" in cleft sentences as in (4).

If CP is the unmarked category for relative clauses and this is part of the reason for the overgeneration of "no", then an

explanation must be provided for the fact that the "no" cannot occur as C in relative clauses in the adult grammar of Japanese. Two reasons for the invisibility of C in the adult grammar can be conjectured. One possibility is that the node C exists, but it simply cannot be lexically realized. The other is that there is no structural position for C. The former assumes that the Japanese relative clauses have a null complementizer. The latter assumes that Japanese relative clauses are not CPs. Rather, as Saito (1985) suggests, Japanese relative clauses are IPs.

3. Syntactic Evidence for the IP Hypothesis

I argued in Murasugi (1990, 1991a, b) for the latter possibility on the basis of a difference between Japanese and English relative clauses. The crucial difference is shown in (6).

- (6) a. the reason [(why) Mary thinks [that John left e.]]
 b. *Mary-ga [John-ga e: kaetta to] omotteiru] riyuu:
 -NOM -NOM left C think reason
 (the reason Mary thinks that [John left t.]
- (7) a. the book [(which) [Mary thinks [that John bought e]]
 b. [Mary-ga [John-ga e katta to] omotteiru] hon.
 -NOM -NOM bought C think book
 (the book Mary thinks that [John bought e]
- (8) a. the reason [(why) [John left e.]]
 b. [John-ga e: kaetta] riyuu
 -NOM left reason
 (the reason [John left e.]

In Japanese relative clauses, relativization of an argument position is unbounded, as shown in (7b), but relativization of a pure adjunct is clause bound, as the contrast between (6b) and (8b) shows. On the other hand, in English, relativization of either kind is unbounded, as shown in (6a) and (7a).

Here, it should be noted that argument relativization in Japanese does not even exhibit island effects. Thus, the following example from Kuno (1973) is perfect:

- (9) [[e_i e_j kiteiru] yoofuku_j]-ga yogoreteiru] sinsi;
 is-wearing clothes -NOM is dirty gentleman
 (Lit. the gentleman whose clothes is dirty)

Perlmutter (1972) explains this fact as follows. Since Japanese allows pro in any argument position, e_j in (9) need not be a trace, but can be a pro. Hence, (9) can be base-generated without movement, and consequently, no island effects are expected.

Given Perlmutter's account, (7b) can also be base-generated without movement. On the other hand, the ungrammaticality of (6b) indicates that pro is not allowed in the position of an adjunct. It indicates further that adjunct relative clauses in Japanese cannot be derived by successive-cyclic movement. And this follows from the ECP, as formulated in Lasnik and Saito (1992), if Japanese relative clauses are IPs, not CPs. According to this IP hypothesis, the structure of (6b), when it is derived by movement, will be as follows:

- (10) [_{NP} [_{IP} Op_i [_{IP} ... [_{CP} t'_i [_{IP} ...t_i...]]]]] riyuu.]

The initial trace t_i is antecedent governed by the embedded COMP, which receives index i from the intermediate trace via SPEC/head agreement. But the intermediate trace fails to be antecedent governed, and hence, violates the ECP. The potential antecedent governor for this trace is the empty operator adjoined to IP. But this operator cannot serve as an antecedent governor because of the condition in (11).

- (11) Only X' category can be antecedent governors.

Thus, (10) is ruled out by the ECP.

The analysis for (6b) presented above crucially relies on the hypothesis that Japanese relative clauses are IPs, and hence, if correct, provides support for this hypothesis. According to this analysis, relativization of manner/reason phrases is completely disallowed in Japanese. Let us consider (8b), repeated below as (12).

- (12) [John-ga e_i kaetta] riyuu:
 -NOM left reason
 (the reason [John left e_i])

This example cannot be base-generated as a relative clause since the e_i being a reason phrase, cannot be base-generated as pro. Hence, it must be derived by movement. But if (12) involves movement and relative clauses are IPs in Japanese, the example has the configuration in (13).

- (13) ...[_{IP} Op_i [_{IP} ... t_i...]]...

Since the trace in (13) is an adjunct trace, the ECP requires that it be antecedent governed. But as noted above, it is argued in Lasnik and Saito (1992) that only X-zero categories can be antecedent governors. In (13), the only potential antecedent governor is the empty operator, and it is not an X-zero. Hence, (13) is ruled out by the ECP.

Given this conclusion, (12) should be analyzed as an instance of pure complex NP like those in (14).

- (14) a. the reason for John's leaving
 b. the reason for Mary's saying that John left

Note that in (14b), 'the reason' cannot be construed with 'John left'. Thus, this analysis correctly predicts the "clause-boundedness of adjunct relativization" shown in (6b).

4. The Learnability of the IP Hypothesis

The previous section presented some syntactic evidence that Japanese relative clauses are not CP modifiers, but in fact, are IP modifiers. This section turns to the learnability problem concerning the acquisition of Japanese relative clauses.

The question to be addressed here is why and how those children who exhibit the overgeneration of "no" attain the knowledge that relative clauses are IPs in Japanese. According to this hypothesis, those children who show the overgeneration of "no" are those who initially hypothesize that relative clauses are CPs. This may be because the unmarked category for relative clause is CP. Those children know that "no" can be of the category C. This knowledge is accessible on independent grounds from positive evidence. C is realized as "no", for instance in Japanese cleft sentences as shown in (4), repeated below as (15).

- (15) [CP [IP doroboo-ga kane -o nusunda] no]-wa koko kara da
 robber -NOM money-ACC stole -TOP here from is
 (It is from there that the robber stole the money.)

Thus, the children overgenerate "no" in relative clauses. However, they clearly need to know that the target grammar has only IP relative clauses. Here, a lexical complementizer does not appear in relative clauses in the adult grammar of Japanese as shown in (16).

- (16) [John-ga mita (*no)] hito
 -NOM saw person
 (the person John saw)

And it may seem possible that this fact serves as positive evidence for children to attain the target grammar. The Japanese speaking children receive, as input, relative clauses without a lexical complementizer, and from this evidence, infer that Japanese relative clauses are IPs.

But this hypothesis immediately faces a problem. C is only optionally realized in English relative clauses, as shown below.

- (17) the cookie (that) Mary ate

Thus, English speaking children must receive input such as "the cookie Mary ate." But they apparently do not infer from such input that English relative clauses are IPs. Instead, they only find out that the realization of the complementizer "that" is optionally allowed. Hence, it is not clear how the Japanese speaking children could infer on the basis of examples like (16) that Japanese relative clauses are IPs.

Then, what evidence makes the Japanese speaking children attain their target grammar? The key to solve this learnability problem, I believe, can be found when we consider the syntax of pure complex NPs in English and Japanese. Observe the example of pure complex NP in (18).

- (18) the fact [_{CP}*(that) [_{IP} John is smart]]

In English, pure complex NPs require the head C of the modifying CP to be realized. In Japanese, on the other hand, as shown in (19), C does not show up, as in the case of relative clauses.

- (19) [John-ga kasikoi (*no)] koto
 -NOM is clever fact
 (That John is smart)

Stowell (1981) discusses English examples like (18), and proposes to explain the obligatoriness of "that" in terms of ECP.

He first notes the subject/object asymmetry illustrated in (20).

- (20) a. Bill thinks [_{CP} (that) [_{IP} John is smart]]
 b. [_{CP} *(that) [_{IP} John is smart]] is obvious

The complementizer that is obligatory when the CP is in the subject position, but not when it is in the object position. Stowell proposes that when that is missing, there is an empty category in C and it is subject to the ECP. When the CP is in object position as in (20a), the CP, and hence, the head C is lexically governed by the verb. Thus, an empty C is allowed. But in (20b), the CP is not lexically governed. Hence, the head C is not properly governed at all, and an empty C cannot occur in this position. Extending this analysis to (18), Stowell argues that in a pure complex NP, the N (even if it is a derived nominal) does not assign a theta role to the CP, but is in apposition to it. Given this, the obligatoriness of that in (18) follows from the ECP. When that is absent, there is an empty category in C. This empty category is not lexically governed by N, and thus, is not properly governed at all. Hence, the ECP rules out the possibility of an empty C in pure complex NP.

Suppose that the structure of pure complex NPs in Japanese is the same as that in English. Then, given that the ECP is a UG principle, we predict that C should be lexically realized in Japanese, exactly as in English. However, this prediction is not borne out. Therefore, if we assume the universality of the ECP, it follows that the sentential modifier in Japanese pure complex NPs is not CP, but IP. Note here that Japanese speaking children can attain this knowledge on the basis of examples such as (19). Given the ECP, (19) constitutes a straightforward piece of positive evidence that sentential modifiers in Japanese pure complex NPs are IPs. If the sentential modifier in (19) is a CP, then this example violates the ECP. Hence, the ECP implies that there is no C, and hence, no CP, in this example.

Suppose that the category of sentential modifiers in NP is parameterized; it is CP or IP depending on the language, and the unmarked setting is CP. That implies that in a given language, the

categories of pure sentential modifiers and relative clauses are both CP or both IP. Then, the learnability problem of Japanese relative clauses will be given a straightforward solution. Assume that children know the ECP in UG. On the basis of examples such as (19), the Japanese speaking children find out that the category of NP-internal sentential modifiers is IP in Japanese. In particular, they find out that relative clauses are IPs. Once this target structure is fully attained, the overgenerated "no", which was once realized in the C position, will not be considered even optional. Rather, it will be concluded that "no" should not appear. This is because there is no C position in which "no" can be realized in the attained grammar.

5. Conclusion

The goal of this paper was to show that there is a case that children's knowledge of a particular syntactic principle functions as the trigger for retreatment from the overgeneration. In particular, I provided evidence that the Empty Category Principle can work as the trigger for retreatment from an overgeneration in noun phrases, based on acquisition studies with Japanese speaking children.

This paper dealt with the following specific questions: why and how the Japanese children overgenerate "no" of the category C in relative clauses and why and how they retreat from it. I proposed that Japanese relative clauses are IPs, and showed that given this IP hypothesis, a difference between English and Japanese relative clauses directly follows from ECP, as formulated in Lasnik and Saito (1992). Japanese children make the initial hypothesis that relative clauses are CPs. They lexically realize the head C as "no", as there is independent evidence that C is lexically realized as "no", e.g., in cleft sentences. They later attain the knowledge that Japanese relative clauses are IPs, and hence, cease to generate "no" in relative clauses. It was shown that this hypothesis meets the learnability criterion. On the basis of positive evidence on pure complex NPs, Japanese children infer that all prenominal sentential modifiers are IPs. My proposal is that the trigger for the retreatment is the ECP, a principle of Universal Grammar. This paper, thus, provides a case study for a syntax-based learnability hypothesis for the overgeneration phenomenon.

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QUASI-ADJUNCTS AS SENTENTIAL ARGUMENTS
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1. Introduction

This paper is concerned with the exact nature of the typical ECP-type asymmetry illustrated in (1)-(2). (See Huang 1982 for detailed discussion.)

- (1)a. $who_i t_i$ bought what
b. * $who_i t_i$ bought the book why / * $who_i t_i$ solved the problem how
- (2)a. ? $what_i$ does John wonder [whether Mary bought t_i]
b. * why_i does John wonder [whether Mary bought the book t_i]

As shown in (1), an object wh what can be left in situ, but adjunct wh-phrases such as why and how cannot be. Further, as shown in (2), an object wh can marginally be extracted out of an island, but such extraction of an adjunct wh results in total ungrammaticality. As far as we know, there are two major approaches to this asymmetry that are proposed in the literature. The first one, proposed by Huang 1982, hypothesizes that it is an argument/non-argument asymmetry. (See also Lasnik and Saito 1984, and Chomsky 1986.) The second, proposed by Aoun 1985 and Aoun, et al. 1987, attributes the contrast to the referential/non-referential distinction. (See also Rizzi 1990 and Cinque 1990.)

These two approaches lead us to different accounts for the examples in (3).

- (3)a. $who_i t_i$ bought the book where
b. $who_i t_i$ bought the book when

The first will say that (3a-b) are allowed because where and when, like what in (1a), have argument status. A specific version of this hypothesis can be found in Huang 1982. He assumes that locative/temporal phrases in examples such as (3) are adjuncts. But noting the following contrast, he also assumes that where/when, as opposed to why/how, are NPs:

- (4)a. from where / since when
b. *for why / *by how

(4a) shows that where/when can be the object of P, and thus, indicates that they are NPs. Then, given this categorial distinction between where/when and why/how, Huang suggests that where/when in (3) are objects (and hence, arguments) of an empty P. According to this analysis, the more precise structure of (3a) is as in (5).

- (5) $who_i t_i$ bought the book [pp[pe] where]

The examples in (1b) cannot have a similar structure because why/how are not NPs, and hence, cannot be an object of P. This analysis is quite attractive since it accounts for (3) and (6) in exactly the same way.