

## **Economy in Interpretation: A Study of Children and Binding\***

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### **1. Introduction**

The early studies on the children's knowledge of Binding show that typically developing children around 5 years old violate the Principle B about 50% of the time and that they follow the Principle B later than they follow the Principle A—a phenomenon known as the Delay of the Principle B Effects (henceforth, DPBE). These early findings thus led to the conclusion that children know the Principle A but not the Principle B. The DPBE raises a serious problem for the hypothesis of the UG-Constrained Maturation. This hypothesis states as follows:

(1) UG-Constrained Maturation Hypothesis (Borer and Wexler 1987)

At every time, the principles of UG constrain the child's grammar. Certain capacities might be missing from the child's grammar, capacities that later mature, but no principles are missing.

I will call this the Maturation Hypothesis, for the sake of simplicity, in the following discussion. Unfortunately, this hypothesis wrongly predicts that there is no difference in the acquisitions of the Principle A and B. One kind of response to this puzzle is to attribute children's mistakes to their immaturity in certain capacities other than the principles of UG. Some researchers, including Chien and Wexler (1990) and Grodzinsky and Reinhart (1993), pursue this idea but they differ in terms of what capacities are immature in the child's grammar.

This paper aims to defend the Maturation Hypothesis and the Subset Principle by investigating the children's knowledge of Binding. The basic idea is that interpreting reflexives as well as pronouns requires competition between two types of interpretive processes and that children stick to their initial commitment when they cannot figure out which one of two competing representations is appropriate in a given context. This accounts for the DPBE and young children's anaphora mistakes, which are unexpected under the Subset Principle. The analysis demonstrates that our system of interpretation inherently prefers the representation obtained economically and therefore, it strongly supports the Economy Principle, which is a vital concept within the current syntactic research.

This paper is organized as follows. Section 2 overviews previous researches and points out their problems. Section 3 introduces Reuland's approach to Binding, which is the basis of the analysis in this paper. We will see that this approach explains the DPBE but it remains unexplained why young children make anaphora mistakes. Section 4 observes the common behavior between young children and the individuals with Down Syndrome and provides a solution to the problem discussed in the previous section. Section 5 demonstrates that the analysis presented in this paper gives an answer to the issue in the study of scope resolution. Section 6 concludes the paper.

### **2. Previous Researches**

Chien and Wexler (1990) (hereafter, C&W) notice that pronouns allow accidental coreference in some

cases and claim that the early studies on the children's knowledge of Binding do not focus on the binding aspects of pronouns. Let us consider the following example:

(2) That must be John. At least he looks like him.

In this example, both *he* and *him* can be taken to be *John*. Notice that *he* cannot bind *him* in this case due to the Principle B. It is clear that this is the case of accidental coreference of two noncoindexed DPs. Two noncoindexed DPs are free in reference and may or may not corefer. The rule that governs coreference is formalized as follows:

(3) *Rule I: Intrasentential Coreference*

NP A cannot corefer with NP B if replacing A with C, C a variable A-bound by B, yields an indistinguishable interpretation.<sup>1</sup> (Grodzinsky and Reinhart 1993:79)

In order to decide whether the *Rule I* allows the pronoun in (4a) to corefer with *John*, for example, we need to compare the representations in (4b) and (4c):

- (4) a. John thinks he is a great cook.  
b. x thinks x is a great cook & x=John  
c. x thinks y is a great cook & x=John & y=John

Notice that (4c) does not yield an indistinguishable interpretation from (4b). In this case, coreference is not allowed without the appropriate context. It must be taken into consideration whether the Principle B allows (4b) at the same time. That is to say, two independent rules concern the interpretation of pronouns. Therefore, we need to exclude the possibility of accidental coreference to investigate precisely whether children know the Principle B. C&W design some experiments for this purpose and find that children disallow a pronoun to be bound by a local c-commanding quantifier in the sentence like (5), which always requires the bound variable reading and does not allow accidental coreference.

(5) Every boy touches him.

Based on this observation, they argue that children know the Principle B but they have not acquired the *Rule I*. Unfortunately, they wrongly predict that children accept as grammatical every sentence that the *Rule I* excludes and therefore, they cannot explain why children perform at chance level rather than below chance.

Grodzinsky and Reinhart (1993) (henceforth, G&R) notice that agrammatic aphasics succeed in binding tasks and fail in coreference tasks just like children, indicating that they suffer a similar deficiency. Moreover, children and agrammatic aphasics show the same behavior when they are presented a sentence containing an ambiguous word as below:

- (6) a. The FBI agent searched the room for BUGS.  
b. He caught spiders, roaches and other BUGS.

The word BUGS can be replaced with SPY in (6a) whereas it can mean ANT in (6b). Both children and agrammatic aphasics show a priming effect for only one of these meanings; it is not necessarily the one

determined by context but the one with the higher frequency of occurrence, namely ANT in this case. If context were to have any effect at all, we would expect it to force the selection of the proper meaning, but here a completely irrelevant factor—frequency—surfaces and dictates which meaning would be primed. Based on this observation, G&R claim that children and agrammatic aphasics cannot hold two representations in memory for the purpose of comparing them with prior context. It is important to mention that they share the assumption with C&W that children know the Principle B as well as the Principle A. This overcomes the problem for the Maturation Hypothesis discussed above. However, they differ in terms of what capacity is missing from the child’s grammar.

Interestingly, they both consider that we need to compare two representations to determine the reference of pronouns but they assume that interpreting reflexives is governed only by the Principle A. Accordingly, they predict that children never make mistakes as long as the Principle A is concerned. Contrary to this prediction, C&W reports that young children often make anaphora mistakes by coindexing a reflexive with a nonlocal c-commanding antecedent. This fact also raises a problem for the Subset Principle. This principle is formalized as follows:

(7) Subset Principle (Berwick 1985)

Learners initially choose the value of a parameter that generates the smallest possible language.

It is well known that a reflexive cannot corefer with a non-local antecedent in English whereas it can in Icelandic. This fact indicates that English is the smallest possible language in terms of the interpretation of reflexives. Accordingly, the Subset Principle wrongly predicts that English-speaking children never make anaphora mistakes by coindexing a reflexive with a non-local c-commanding antecedent. Therefore, we need to consider why young children make anaphora mistakes. One of the ways to answer this question is to assume that we also compare two representations when we interpret reflexives. We will pursue this idea in the following discussion.

**3. Rule BV and Economy in Interpretation**

We have assumed so far that Binding is governed by the principles of UG. Chomsky (2008) suggests, however, that the Binding Theory is at the outer edge of the C-I interface. As for the Principle A, he adopts the framework of Reuland (2001). Let us now look at Reuland’s approach to Binding in detail. He notices that both the anaphor in (8a) and the pronoun in (8b) can be translated as bound variables and argues that both processes in (8a) and (8b) relate with the interpretation of reflexives.

- (8) a. Mary touches herself. → Mary  $\lambda x$  (x touches x)
- b. Mary touches her. → Mary  $\lambda x$  (x touches x)

He further proposes the following rule to express that the process in (8a) is preferred over the one in (8b):

(9) *Rule BV: Bound variable representation:*

NP A cannot be A-bound by NP B if replacing A with C, C an NP such that B heads an A-CHAIN tailed by C, yields an indistinguishable interface representation.<sup>2</sup> (Reuland 2001:462)

He explains why A-chain formation concerns the interpretation of reflexives by assuming feature movement,

which is abandoned in the current syntactic framework. Instead, I assume that a reflexive forms an A-chain with its antecedent via Internal Merge and one of members of the chain is pronounced as a reflexive, as illustrated below:<sup>3</sup>

- (10) syntax: Mary touches [Mary].  
PF: Mary touches herself.

The fact that the examples below allow both the strict and the sloppy readings provides supporting evidence to this assumption.<sup>4</sup>

- (11) a. Max hit himself before Oscar did.  
b. Bush voted for himself, and Barbara did.

Suppose that a reflexive can be transferred to semantics either in the forms of the copy of its antecedent or in the forms of a variable. Then, we can explain why these sentences have ambiguity. Specifically, the strict reading is obtained when the copy keeps its form in semantics as in (12a), while the sloppy reading is gained after the copy changes its form into a variable bound by its local antecedent as in (12b).

- (12) a. ... Oscar did [<sub>VP</sub> hit [Max]]. = strict reading  
b. ... Oscar<sub>1</sub> did [<sub>VP</sub> hit  $x_1$ ]. = sloppy reading

Notice that the ambiguity observed in (11) also indicates that two processes concern the interpretation of reflexives.

Adopting this framework, interpreting anaphors as well as pronouns require the competition between two processes to obtain the appropriate interpretation. The *Rule BV* expresses that deriving (14b) syntactically from (13a) via (14a) by A-chain formation is preferred over obtaining (14b) from (13b). The *Rule I* defines that the route of interpreting (13b) via (14b) is taken rather than through (14c), even though the derivation from (13b) to (14b) is ultimately blocked.<sup>5</sup>

- (13) a. Mary touches herself.  
b. Mary touches her.
- (14) a. Mary touches [Mary].  
b. Mary  $\lambda x$  (x touches x)  
c. Mary  $\lambda x$  (x touches y) & y = Mary

In order to derive the ranking involved in the *Rule I* and the *Rule BV*, Reuland distinguishes four types of linguistic operations as in (15) for representing a relation between arguments and assumes that the detectable amount of cost is associated with these cross-modular operations.

- (15) a. The operation applying within the computational system  
b. The operation relating syntactic representations to the C-I interface representations  
c. The operation applying at the C-I interface  
d. The operation relating C-I interface representations to the discourse storage

In (14a) the dependency between arguments is expressed within the computational system by chain formation and is established before the operation applies at the C-I interface. Accordingly, the number of the cross-modular operations involved here is two, namely (15a, b). In (14b) the dependency between arguments is linguistically expressed in the bound variable structure. The variable is assigned its value at the C-I interface. Thus, we need three cross-modular operations represented in (15a-c). In (14c) the dependency is not linguistically expressed at all, but can only be established by accessing the discourse storage. Accordingly, all the operations in (15) are required. That is, four cross-modular operations are needed in this case. Consequently, deriving (14b) via (14a) from (13a) necessitates less cross-modular operations than obtaining (14b) from (13b); hence the former is more economical. The route from (13b) to (14b) is more economical than the one from (13b) to (14c).

Let us now consider how this approach explains the DPBE. To interpret (13a) correctly, we need to obtain (14a) rather than (14b). This indicates that the correct way of interpreting reflexives coincides with the more economical process than the other. To interpret (13b) correctly, we need to access the discourse storage to assign a value to the pronoun (irrespective whether coreference is allowed or not within the given context). This means that the way to get the correct interpretation of pronouns is costlier than the one to access the incorrect interpretation. Suppose that children have inherent preference for the representation obtained economically. Then, we can easily explain why children tend to show difficulty in interpreting pronouns. Their inherent preference overrides the other competing representation.<sup>6</sup> This model also accounts for the fact that children around 5 years old can interpret reflexives correctly. Children have only to follow their inherent preference when they interpret reflexives. In short, it causes the DPBE that the correct interpretation of pronouns relates with the costlier representation while the one of reflexives ties with the costless representation.

#### **4. Delay of the Principle A Effects in Down Syndrome**

We have assumed so far that we need to compare two processes when we interpret reflexives. This seems to be superior to the assumption in previous studies that only one representation concerns the interpretation of reflexives in explaining young children's anaphora mistakes. However, we still cannot make a correct prediction since their inherent preference coincides with the correct interpretation and it should override the incorrect interpretation. This section discusses the knowledge of Binding in individuals with Down syndrome (hereafter, DS) and provides a solution to this problem.

In an experiment designed to tap into the knowledge of Binding in individuals with DS, it is found that subjects have specific difficulty in assigning the appropriate interpretation to reflexives, as opposed to pronouns. This pattern is the reverse of the DPBE and hence is called the DPAE in DS. If language development in DS were simply delayed but essentially normal, then investigations of the availability of Binding in DS should demonstrate parallels to normal language development. Perovic (2002) reports, however, that subjects with DS perform around chance level on conditions involving reflexives while they correctly reject locally bound pronouns and accept coreference interpretation almost 100% of the time. Based on this observation, he argues that the pattern shown in DS is not caused by the unavailability of the Binding Principle but rather a specific deficiency in establishing binding relations.

He further notes that subjects with DS fail the task on passives on the test of comprehension of grammar. Interestingly, Borer and Wexler (1987) notice that normally developing children also have difficulty in understanding passives and propose that the ability to form A-chains matures only at around the age 4 or even 5 years old. Recall that children younger than this age make anaphora mistakes as well.

That is, both the subjects with DS and young children show difficulty in interpreting reflexives and passives, both of which involve A-chain formation.<sup>7</sup> According to Chien and Wexler (1990: 265), it is later than 5 years old that children clearly demonstrate the knowledge of the Principle A. This overlaps with the timing of maturation of A-chain formation. Based on this observation, I argue that immaturity in A-chain formation prevents young children and subjects with DS from interpreting reflexives as well as passives.

Having established the evidential basis for the claim developed here, it is important to examine whether previous approaches can explain the facts presented in this section. C&W adopt the Lexical Learning Hypothesis to explain young children's anaphora mistakes and argue that the learning task that *herself/himself* is a reflexive completes around 6 years old and is later than the one that *her/him* is a pronoun. Following this argument, a subject with DS whose verbal mental age is under 6 should fail to interpret pronouns as well as reflexives. Contrarily, the fact is that they succeed in the experiments about pronouns almost 100% of the time. R&G's analysis also fails to explain the DPAA in DS. They assume that both the Binding Principle and the *Rule I* are included in UG and that only the *Rule I*-governed structures are beyond children's computational capacity. To explain the DPAA in DS, they need to make a contradictory hypothesis. That is, only the Principle A-governed structures are beyond the computational capacity of subjects with DS. One might assume that the Binding Principle and the *Rule I* belong to the different modules (syntax and pragmatics, respectively). This assumption amounts to say that children have a problem about pragmatics while subjects with DS are deficient in syntactic principles. This analysis still needs to explain why subjects with DS do not show deficiency in the interpretation of pronouns. It is not plausible to consider that they know the Principle B but they lack the Principle A because both of them are principles of UG. Therefore, it seems that R&G cannot provide a solution to this problem under any assumption. Furthermore, the previous approaches might wrongly predict that children cannot interpret reflexives at all before the maturation of the ability to form A-chains since the only representation they access necessarily relates with A-chain formation. On the other hand, the analysis developed here allows young children to interpret reflexives since it assumes that interpreting reflexives relates with the process which does not include A-chain formation in syntax as well as the one involving it. To be specific, young children whose ability to form A-chains are immature cannot establish the dependency between two arguments in syntax but they can assign value to a variable at the C-I interface. Therefore, young children's behavior strongly supports the analysis presented in this paper.

## 5. Scope Resolution

We have seen so far that children have an inherent preference for the representation obtained economically as far as Binding concerns. The same can be observed more strongly in the studies of the scope resolution. Musolino et al. (2000) notice that preschool children differ systematically from adults in the way they interpret sentences containing a quantified NP and negation like (18a):

- (18) a. Every horse didn't jump over the fence.  
 b.  $\forall x[\text{horse}(x) \rightarrow \neg \text{jump over the fence}(x)]$  (surface-scope interpretation)  
 c.  $\neg \forall x[\text{horse}(x) \rightarrow \text{jump over the fence}(x)]$  (inverse-scope interpretation)

This sentence is scopally ambiguous. On one interpretation, (18a) can be paraphrased as meaning that every horse is such that it didn't jump over the fence. Here, the universally quantified subject takes scope over negation, as illustrated by the logical representation given in (18b). Another possible interpretation of

(18a) is that not all of the horses jumped over the fence. In this case, negation takes scope over the quantified subject, as shown in the logical representation expressed in (18c). Let us then consider the example below:

- (19) a. The detective didn't find some guys.  
b.  $\exists x [\text{guy}(x) \ \& \ \neg \text{find}(\text{detective}, x)]$  (inverse-scope interpretation)

In contrast with (18a), (19a) always requires the inverse-scope interpretation since a positive polarity item *some* cannot be interpreted within the domain of negation. Musolino et al. test children's comprehension of such sentences and find that while adult speakers of English easily obtain the inverse-scope interpretation, children assign such sentences only the surface-scope interpretation. Based on this observation, they argue that children do not have the ability to access the inverse-scope interpretation.<sup>8</sup>

This argument is challenged by Gualmini (2004). In particular, he claims that children's failure to access the inverse-scope interpretation of (19) is not the result of a limitation to the surface-scope interpretation. He discovers that if the context is changed so as to make the inverse-scope interpretation more accessible, children accept it to a much larger extent. He claims that subjects experience difficulty in processing negative sentences in the absence of context, and in contexts that are arguably infelicitous for their use. He further suggests that this difficulty arises from the violation of the felicity condition, which states that negative sentences should be used only to point out discrepancy between the facts and the listener's expectation. For example, in the context that the troll was supposed to deliver all four of pizzas but unfortunately lost two on the way, the following statements have the same truth value for the inverse-scope interpretation but they differ in felicity:

- (20) a. The troll didn't deliver some pizzas.  
b. The troll didn't lose some pizzas.

Specifically, (20a) is felicitous because it points out the discrepancy between what was expected to happen and what actually happened. On the other hand, (20b) does not introduce such discrepancy so that it does not meet the felicitous requirement for a negative sentence. Gualmini finds out that children accept (20a) at much a higher rate than (20b). This observation indicates that the previous view that children lack the ability to access the inverse-scope interpretation cannot be correct. The result of his study, in turn, means that some children access the surface-scope interpretation of (20b), which makes the target sentence false, despite the fact that they have the ability to access the inverse-scope interpretation. As a consequence, the research question that now needs to be addressed is why children show the preference for the surface-scope interpretation of sentences like (20b) to a larger extent than adults.

As I mentioned earlier, children differ systematically from adults in the way they interpret sentences containing a quantified NP and negation. However, this does not mean that adults do not have a preference for the surface-scope interpretation of scopally ambiguous sentences. Musolino and Lidz (2006) notice that under certain conditions, even adults exhibit the preference for the surface-scope interpretation when they interpret negative sentences containing a numeral. It is also reported that in the investigation of the adults' real-time comprehension of doubly quantified sentences, perceivers read the sentence more slowly when they assign it the inverse-scope interpretation even when that interpretation is supported by the context (Anderson 2006). This seems to indicate that children's preference for the surface-scope interpretation is an exaggerated version of adults' preference.

As for the scope resolution in adults' language, there are two types of approaches. The Inherent Preference Model argues that the surface-scope interpretation is inherently preferred over the inverse-scope interpretation under the assumption that some additional operation like covert movement or reconstruction is required to obtain the latter interpretation (Frazier 1999, Frazier and Clifton 1997, Clifton and Duffy 2001, Tunstall 1997, etc.). In contrast, a Constraint-Based Model of sentence comprehension (e.g., Trueswell 1996, Spivey and Tanenhaus 1998) attributes processing difficulty to competition between two representations that the parser considers in parallel. In one such model (Altmann and Steedman 1988), competing analyses are evaluated in parallel for plausibility with respect to the discourse context. Since the parser prefers the analysis that carries fewer unsupported presuppositions, accommodating additional presuppositions leads to processing difficulty. In short, the issue here is whether there is an inherent preference or not when we interpret scopally ambiguous sentences.

Our study of children's knowledge of Binding has shown that children have an inherent preference for the economical representation. Suppose that the same holds of the scope resolution. Then, we obtain an answer to the question why children show the preference for the surface-scope interpretation to a larger extent than adults. Both children and adults have an inherent preference for the first-computed and thus more economical surface-scope interpretation but only children stick to their initial commitment due to their immaturity in recovering from it. Consequently, I argue that the Inherent Preference Model is the correct approach to the scope resolution.

## **6. Concluding Remarks**

We have seen that we need to compare two processes when we interpret reflexives as well as pronouns. Children make mistakes in interpreting pronouns due to the inherent preference for the representation obtained economically. Young children make mistakes in interpreting reflexives due to their immaturity of A-chain formation. This means that their lack of knowledge of the Binding Principle is not the cause of their failure. Therefore, the analysis presented here supports the Maturation Hypothesis. The Subset Principle can be maintained as well since UG forces even English speaking children to compare two representations when they interpret reflexives.

It has also shown that the representation obtained economically is preferred over the complex one in interpreting scopally ambiguous sentences. I consider that we have such a preference in general due to the Economy Principle, which requires that the derivation and representations should be minimal (Chomsky 1995). It is reasonable to consider that our system of interpretation obeys the Economy Principle as well since both syntax and our system of interpretation are dominated by the Faculty of Language. Therefore, the findings in this paper strongly support the current view that the linguistic expressions are the optimal realizations of the interface conditions, where optimality is determined by the Economy Principle.

## **Notes**

\* An earlier version of this paper was presented at the 33<sup>rd</sup> Annual Meeting of the Kansai Linguistic Society held at Osaka Shoin University, January 7-8, 2008. I would like to thank Andrea Gualmini for all his help and advice during the preparation of the earlier version of this paper. He has spared much of his time to discuss the topic of this paper. His comments helped me clarify the problems discussed in this paper. I am also indebted to Yoko Yumoto, Yoichi Miyamoto, Masao Ochi, and Hiroshi Mito for their helpful comments and invaluable suggestions. I would also like to express my gratitude to the audience at the meeting for valuable comments and suggestions. I especially thank Koji Fujita and Takahiro Honda for their comments and discussion. All remaining errors and inadequacies are of course my own.

<sup>1</sup> The logical-syntax-based definition of A-binding as in (i) is adopted here:



(i)  $\alpha$  A-binds  $\beta$  iff  $\alpha$  is the sister of a  $\lambda$ -predicate whose operator binds  $\beta$ . (Reuland 2001: 440)

<sup>2</sup> A-CHAINS are formed by linking A-Chains and A-chains, as follows:

(i) If  $(\alpha_1, \alpha_2)$  is a Chain and  $(\beta_1, \beta_2)$  is a chain and  $\alpha_2 = \beta_1$ , then  $(\alpha_1, \alpha_2/\beta_1, \beta_2)$  is a CHAIN. (Reuland 2001: 458)  
If linking applies to the objects  $(\alpha_1, \alpha_2)$  and  $(\beta_1, \beta_2)$ , the member to be eliminated as  $\alpha_2/\beta_1$ . The ensuing CHAIN is  $(\alpha_1, \beta_2)$ . Chain expresses the notion of *checking chain* and formed by checking/deletion, in addition to *chain*.

<sup>3</sup> We still need to consider how to decide the pronunciation of two occurrences of *Mary* in (10). One of the possibilities is to attribute to the linear order. Specifically, the linearly preceding member of the chain is pronounced as *Mary* and the following one is realized as a reflexive. However, the following example raises a problem to this analysis.

(i) Pictures of himself annoy John.

In this example, it is not the linearly preceding one but the following one that is pronounced as a reflexive. The other possibility is to follow Kayne's (2002) analysis of bound pronouns. He proposes that a pronoun and its antecedent are in a same relation as a clitic and its double. The pronoun *he* and the antecedent *John* in (iia) are base-generated as [*John he*] as in (iib). *John* inside it then moves out to its surface position, as shown in (iic).

- (ii) a. John thinks he is smart.
- b. [[John he] is smart]
- c. [John thinks [(John) he] is smart]

If this analysis is correct, it is plausible to assume that the reflexive and its antecedent in (i) are base-generated within the same constituent as [*John himself*]. Following Belletti and Rizzi's (1988) argument that the subject of psych verbs is originated within VP, [*John himself*] originates as a complement of the verb as in (iiia). *John* inside it then raises and adjoins to VP, as shown in (iiib). Finally, the subject moves to its surface position, as illustrated in (iiic).

- (iii) a. [annoy picture of [John himself]]
- b. [[annoy picture of [(John) himself]] John]
- c. [Picture of [(John) himself] [[annoy (picture of [(John) himself])] John]]

According to this scenario, we do not need to depend on the linear precedence. A reflexive is inserted into the derivation as it is, yet our assumption that A-chain concerns the relation between a reflexive and its antecedent can be maintained. I consider that this analysis is more plausible than the other but I keep assuming in this paper that a reflexive is a copy of its antecedent in syntax and its pronunciation is determined in PF for simplicity. I am obliged to Takahiro Honda for notifying me this issue.

<sup>4</sup> This point was suggested to me by Yoichi Miyamoto. I would like to express my gratitude to him for drawing my attention to the paradigm in (11).

<sup>5</sup> Notice that derivation from (13b) to (14b) itself is allowed since the Principle B is not adopted in this framework. It is blocked because deriving (14b) from (13a) via (14a) is preferred.

<sup>6</sup> This is supported by the fact that children around 5 years old misinterpret temporarily ambiguous sentences. Let us consider the following example:

(i) Put the frog on the napkin in the box.

In this example, the prepositional phrase *on the napkin* could be indicating the destination (i.e., where the frog is to be put) or it could be a modifier phrase (i.e., indicating a frog which is found on a napkin). Upon hearing the ambiguous phrase on the napkin, children are looking to the incorrect destination. This eye movement pattern suggests that children's initial interpretation of the ambiguous phrase *on the napkin* is as a destination rather than as a modifier. To interpret the sentence correctly, they need to recover from their initial misinterpretation. However, they still show strong VP-attachment preference even after they hear the whole sentence. Based on this observation, Trueswell et al. (1999) argues that children do not have the ability to revise their initial commitment to the destination interpretation.

<sup>7</sup> Specifically, passives require A-chains and reflexives need A-CHAINS by definition. This seems to indicate that passives and reflexives involve different operations. Reuland suggests, however, that CHAINS can be reduced to chains.

<sup>8</sup> See also Musolino (1998) and Lidz and Musolino (2002).

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## 解釈における経済性 —子供と束縛現象についての考察—

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子供の束縛原理の知識を調べると、5歳ぐらいの子供は再帰代名詞よりも代名詞の解釈をはるかに誤りやすく、あたかも束縛原理 B の方が束縛原理 A よりも習得が遅いかのようと思われる。この現象は DPBE と呼ばれ、子供の文法は普遍文法によって支配されており、子供の文法から欠けている原理は無いと仮定する Borer and Wexler (1987) の成熟仮説にとって大きな問題になる。この問題を解決する方法の 1 つは、子供が代名詞の解釈を誤る原因を普遍文法の原理ではなく、別の原因に帰することである。そこで、Chien and Wexler (1990) は代名詞の解釈には束縛原理 B に加えて同一指示を許すか否かを支配する Rule I という規則が関わると提案し、子供は束縛原理は A, B 共に知っているが、Rule I を知らないと主張している。一方、Grodzinsky and Reinhart (1993) は、子供は Rule I も知っているが、2 つの意味表示を記憶する能力が無いと主張している。このように、子供が Rule I を知っているか否かに関しては意見が対立しており、どのような能力の未成熟さが DPBE の原因なのか問題になっている。また両者は、再帰代名詞の解釈には 1 つの表示しか関わらないため、子供は再帰代名詞の解釈を誤らないと主張しているが、実際には 5 歳よりも幼い子供は高い確立で再帰代名詞を誤って非局所的な先行詞と同一指示であると解釈する。この事実は両者の主張にとって問題になるだけでなく、英語を話す子供は常に再帰代名詞が局所的な先行詞と同一の対象を指示すると解釈するという予測をする部分集合の原理にとっても問題になる。

一方、Reuland (2001) は代名詞の解釈だけではなく、再帰代名詞の解釈にも 2 つの表示の比較が必要であり、どちらが選択されるかは Rule BV という規則に支配されていると主張している。この主張に従うと、幼い子供が再帰代名詞の解釈を誤る原因も何らかの能力の未成熟さに帰することが可能である。幼い子供と同様にダウン症患者も再帰代名詞の解釈を誤る上、両者は共に受動文も正しく解釈出来ないことから、両者は同じ能力が未成熟であると考えられる。幼い子供が受動文の解釈を誤る原因は A 連鎖形成の能力が成熟していないためであると Borer and Wexler (1987) は主張している。A 連鎖の形成は Reuland によると再帰代名詞を正しく解釈する過程にも関わっている。以上の観察から、両者が再帰代名詞と受動文の解釈を誤るのは A 連鎖形成の能力が未成熟なためであると主張する。更に Reuland に従うと、再帰代名詞の正しい解釈はより経済的に得られる表示と一致しているが、代名詞の正しい解釈はよりコストの高い表示と一致している。この違いが 5 歳ぐらいの子供が再帰代名詞よりも代名詞の解釈を誤りやすいことに関係していると考えられる。そこで子供はより経済的な過程によって得られた表示を生得的に好み、生得的な好みに従って優先的に得た解釈から別の解釈へ選択を代える能力が乏しいと提案する。つまり DPBE の原因は、再帰代名詞の正しい解釈は子供が生得的に好み、より経済的に得られる表示と合致するが、代名詞はより経済的に得られた表示を選択すると誤った解釈になるためである。

以上のように、子供が代名詞の解釈を誤る原因は普遍文法の原理の知識を欠いているためではなく、経済的に得られる表示を優先するためであることが明らかになった。この分析結果は、子供の文法から欠けている原理はないと主張する成熟仮説を支持するものである。また、再帰代名詞の解釈にも 2 種類の過程の比較が必要であることから、英語を話す幼い子供が再帰代名詞が非局所的な先行詞と同一の対象を指示すると解釈するという事実は、部分集合の原理にとって問題にならないことが明らかになった。経済的に得られる表示を優先させる傾向は、子供のみならず大人にも見られることが量子子の作用域に関する研究において観察されている。このように、我々が経済的な過程によって得られる表示を生得的に好むのは、我々の解釈のシステムが経済性の原理に支配されており、解釈の課

程も可能な限り最小でなければならないと定められているからである。統語も我々の解釈の過程もどちらも言語能力(FL)に支配されていることから、本論は近年の極小主義理論の枠組みを強く支持するものである。