Parameter Settings and the Subset Principle in L2 Acquisition of the Binding Theory

By Takako Kawasaki

1. Introduction

A theory of universal grammar(UG) holds that human beings are innately endowed with a set of **principles** which are true for all languages (this does not mean that these principles always operate in every language.), and **parameters** which vary within defined limits from one language to another. It is assumed that sets of principles and parameters constrain children's first language (L1) acquisition and children set parameters with positive evidence only.

Studies have been done on the availability of UG in second language acquisition (SLA), and the availability of parameter resetting. Many researchers have focused their interests on resetting of the Governing Category Parameter (GCP) in SLA because of its uniqueness. Well-known studies, Finer and Broselow (1986) and Broselow and Finer (1991), investigated parameter setting in SLA and concluded that the learners have picked a value allowed in natural languages but it is an intermediate one, which is neither the L1 nor L2.

However, Broselow and Finer (1991) did not consider the other parameter which seems to play an important role in determining the interpretation of reflexives, that is, the Proper Antecedent Parameter (Wexler and Manzini 1987). In this paper, I will re-examine the data from the study by Broselow and Finer (1991) and suggest that the combination of the Subset Principle and transfer will be able to explain the data.

2. The GCP and The PAP

Principle A of the Binding Theory (Chomsky 1981) illustrates that an anaphor must be bound in its governing category. However, it has been suggested that the choice of governing category varies from one language to another. According to Wexler and Manzini (1987), the GCP has five values as (1) below:

(1) The Governing Category Parameter
A is a governing category for B if A is the minimal category which contains B and
  a. has a subject, or
  b. has an INF, or
  c.has a TNS, or
  d. has an indicative TNS, or
  e. has a root TNS   (Wexler and Manzini 1987:53)

Wexler and Manzini (1987) also proposed another parameter, the Proper Antecedent Parameter (PAP), which has two values in regard to what is allowed as the antecedent of the reflexive in the language.

(2) The Proper Antecedent Parameter
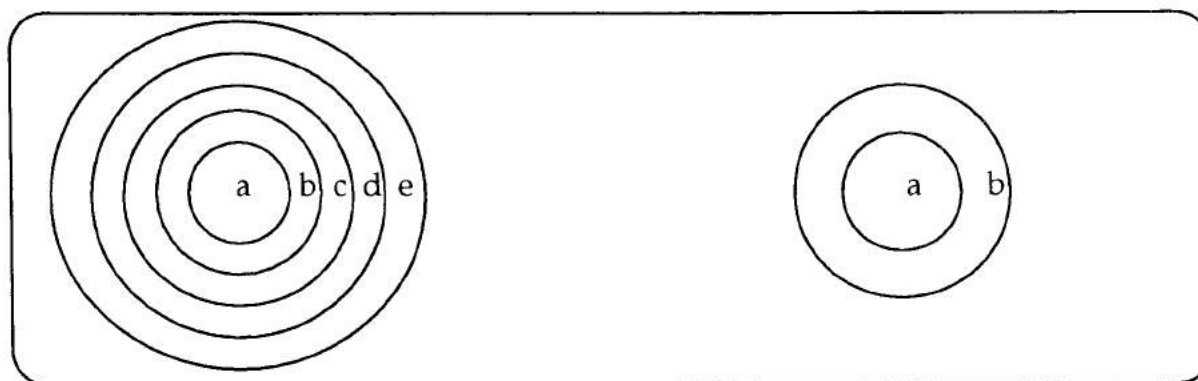   A proper antecedent for A is
      a. a subject B
      b. any element B whatsoever
        (Wexler and Manzini 1987:64)

In both two cases, the parameter values meet the so-called Subset Condition (Wexler and Manzini 1987:60) as below, that is (3), a type (e) language will allow every NP that is allowed in other types of languages.

(3) the GCP   the PAP

The GCP is very unique since it has five values while the other parameters have only two values. For example, the pro-drop parameter has just two values, head right or head left. The GCP is very unique and quite different from other parameters in this point. If we assume that every parameter consists of two-value switches, how can we make it work? Let us assume that each value has two values; + and -, or ON and OFF.

(4) The Governing Category Parameter (version of a set of switches) is a governing category for if is the minimal category which contains and has a(n)

Switch a. subject	ON-OFF	
Switch b. INFL	ON-OFF	
Switch c. TNS	ON-OFF	
Switch d. indicative TNS	ON-OFF	
Switch e. root TNS	ON-OFF	

Even if we assume the GCP like (4), it still does not quite work, because in the GCP, activating the later values has to presuppose activating the former values, that is, if switch (c) is ON, switch (a) and (b) also have to be ON. Also only two consequent switches can be ON; that is, we should not expect the situation in which switch (a) and (e) are ON and the other switches are OFF. Therefore, each switch cannot be independent in this parameter and in order to make this parameter work, some extra principle would be required, which says that if switch (a+1) is ON, the switch(a) must be ON. Hence, even if we separate each value into switches, the GCP is still very different from other parameters.

In regard to children's L1 acquisition, Berwick (1985) and Wexler and Manzini (1987) have proposed the Subset Principle as a learning principle.

(5) The Subset Principle:
> The learning function maps the input data to that value of a parameter which generates a language.

That is, the child first chooses the smallest value of the parameter, and goes beyond only when they encounter the positive evidence for a larger, i.e., more inclusive, grammar. This principle explains the lack of negative evidence in children's L1 acquisition. Does this principle work even in adult SLA?

3. Broselow and Finer (1991

Broselow and Finer (1991) studies the interpretation of English reflexives by 97 adult learners of English as a second language: 30 Korean native speakers whose native language has the value (e) in (1), 37 native Japanese speakers whose native language also has the value (e), and 30 native Hindi speakers whose native language has the value (c). As in the examples below, subjects heard three types of sentences involving reflexives; sentences with object control or exceptional case-marking (6a), sentences with tensed complements (6b), and sentences with subject control verbs (6c).

(6)   a. Mr Fat tells Mr. Thin to paint himself.
      b. Mr. Fat thinks that Mr. Thin will paint himself.
      c. Mr. Fat promises Mr. Thin to paint himself.
      (Broselow and Finer 1991:50-51)

They predicted that if the learners succeeded in resetting the parameters, they will choose Mr. Thin as an antecedent in (6a) and (6b) because the English value of the GCP is the smallest, (1a). If the learners transfer the value of their native languages, Korean and Japanese learners will choose either Mr. Fat or Mr. Thin as an antecedent in each sentence.

(7)	*Tensed*					*Inf*				
	L	NL	L&NL	NL*	L*	L	NL	L&NL	NL*	L*
KK	47	164	45	2	4	50	258	33	6	5
KE	251	4	1	1	3	305	23	3	6	12
	97%	2%			1%	88%	7%	1%	2%	3%
JJ	63	169	90	3	2	71	206	105	19	7
JE	291	28	6	2	5	295	84	7	15	19
	88%	8%	2%		2%	70%	20%	2%	4%	5%
HH	260	1	0	0	0	239	23	2	5	54
HE	269	1	0	0	0	315	8	0	4	2
	100%					96%	2%		1%	

(Broselow and Finer 1991:53)[1]

From this study, they reported that most of the Korean and Japanese learners (97% of Korean and 88% of Japanese) correctly chose Mr. Thin as an antecedent in the sentences with tensed complements. However, in the sentences with untensed complements (infinitival

complements), less people (88% of Korean, and 70% of Japanese) chose Mr. Thin, and some of them chose Mr. Fat as an antecedent. According to Broselow and Finer, this result appears to show that Korean and Japanese learners could distinguish between tensed clauses and untensed clauses. They suggested that this result cannot be attributed to their L1 value since native Korean and Japanese speakers do not distinguish between tensed and untensed clauses in the sentences as in (6). Also this result cannot come from the target language since English makes no distinction between the binding patterns of reflexives in tensed and untensed clauses in the sentences as in (6).

We may think that the subjects in this study might be advanced learners since most of them correctly chose the right antecedent even in infinitival clause. Broselow and Finer (1991) claimed that the learners distinguished tensed and untensed, but it is not so significant from their tabulations in (7). Also, it is not clear what kind of sentences they provided as sentences with subject control properties with tense as in the starred columns in the tensed section. At least in Japanese, there is no such thing as a control clause with tense. Moreover, they did not provide any conclusion about the difference of learners' interpretation between sentences with subject control and those with object control.

However, when we look at their former study (1986), the results seem to be more significant.

(8) Finer and Broselow (1986): the number and the percentage of responses in tensed and infinitive clauses by six Korean learners:

	Tensed Clause	Infinitive Clause	Total
local	22(91.7%)	14(58.3%)	36
non-local	2(8.3%)	9(37.5%)	11
either	0	1(4.2%)	1

From their interpretation (1986, 1991)—namely, that the learners have chosen an intermediate value of the GCP—these data seem to indicate that the Subset Principle is not operating in this case. However, if we take the PAP into consideration, and re-analyze the data, we will notice that the learners might not have chosen the intermediate value by distinguishing tensed and untensed, and there are two other possibilities in which the Subset Principle seems to operate.

4. Discussion

If we take the PAP into consideration, we can notice that there are other possible interpretations in which the Subset Principle operates against Finer and Broselow's interpretation.

(9)   a. Mr. Fat thinks that Mr. Thin will paint himself.
        b. Mr. Fat asked Mr. Thin to paint himself.

From the study done by Broselow and Finer (1991), and Finer and Broselow (1986), Korean and Japanese native speakers could choose Mr. Thin correctly in sentences with a tensed clause like (9a), but were reluctant to choose Mr. Thin, and some of them chose Mr. Fat as an antecedent in sentences with an infinitival clause like (9b). What caused this difference? Based on Japanese or Korean values of the GCP and PAP, they should be able to choose either NP as an antecedent. In each sentence in (9), Mr. Thin is a subject of the verb 'paint' and the

whole sentence should be in the governing category.

One possible reason may be the indirectness of the coindexing in the sentence with the control structure.

(10)　　a. Mr. Fat thinks [that Mr. Thin$_i$ paint himself$_i$].
　　　　b. Mr. Fat asks Mr. Thin$_i$ [PRO$_i$ to paint himself$_i$].

It is assumed that there is a caseless subject, PRO in the embedded clause, in terms of the Projection Principle. That PRO is coindexed with the object, Mr. Thin (Object Control). In the sentence (10b), [PRO to paint himself] is the Governing Category for 'himself,' and 'himself' is coindexed with the subject of the embedded clause, which is coindexed with Mr. Thin because of the object control property of 'ask.' Thus, the coindexing between 'himself' and Mr. Thin is more indirect in (10b) than in (10b).

Therefore, Korean and Japanese learners might be reluctant to choose Mr. Thin as an antecedent.

Some of the learners who incorrectly chose Mr. Fat in (10b) might not have fixed their PAP and still have the value (2a) of PAP, which is the value for both Japanese and Korean. On the other hand, they might have succeeded in fixing GCP into the English value, (1a). This analysis would explain the correct choice of Mr. Thin in (10a), since Mr. Thin is the only subject in the fixed Governing Category, [that Mr. Thin$_i$ paint himself$_i$]. This analysis can also explain the learners' mistakes in (10b), if we assume that some of the learners did not have control structure in (10b) correctly. If they did not realize phonetically unrealized PRO in the sentence (10b) because of its complexity, the only subject in the whole sentence is Mr. Fat.

The problem of this analysis is that Japanese has the same types of control structures presumably.

(11) Mr. Fat$_i$wa Mr. Thin$_j$ ni [zibun$_{i/j}$ o nuru you] tanonda.
　　　　sub.　　　　　obj. refl　　obj.paint comp. asked

In the sentence (11), Japanese reflexive 'zibun' can refer to not only Mr. Fat but also Mr. Thin, even though Mr. Thin is not a subject of the sentence. Unless we assume the existence of PRO in the embedded clause.

(12) Mr. Fat$_i$ wa Mr. Thin$_j$ ni [PRO$_j$ zibun$_{i/j}$ o nuru you]
　　　　　　　sub.　　　　obj.　　　　refl.　obj. paint comp.
　　　tanonda.
　　　asked

If we assume the existence of phonetically unrealized PRO, we find two subjects in the whole sentence, that is, Mr. Fat and PRO. Since PRO is coindexed with Mr. Thin (object control), either Mr. Fat or Mr. Thin can be an antecedent. Thus, Japanese seems to have the same kind of control structure.[2] Then, why did Japanese learners have trouble with the sentence with control structure? This phenomenon seems to support the hypothesis that transfer is the cognitive process, that is, learners have to cognitively realize the similarities between their native languages and the target language in order to transfer the value of their native languages. Control structures are very abstract and not noticed from the surface structure. In this point, it can be said that the control structures are very complex and hard to be noticed. Therefore, the learners might not have been able to directly transfer the control

structure from their native language.

The other possible reason may be transfer from their native language structure. In Japanese and Korean, the object case marker is used for Mr. Thin in a sentence like (10b), while the subject marker is used for the same NP in a sentence like (10a). See examples below.

(13) a. Mr. F wa [Mr. T ga zibun o nuru to] omotta.
      sub.   sub. refl. obj.paint comp. thought

    b. Mr. F wa Mr. T ni [zibun o nuru you] tanonda.
      sub.   obj. refl.   obj. paint comp. asked

(14) a. Mr. F eun [Mr.T ga jashin eul paint hal gorago]
      sub.   sub. refl. obj.   do future
      saenggak hamnida.
      think   verb

    b. Mr. F i Mr.T ege [jashin eul paint] harago hamnida.
      sub.   obj. refl. obj.   to ask

(13a, b) are Japanese translations, and (14a, b) are Korean translation of (9a, b). We notice that in both languages, the object case marker is used for Mr. Thin in the control structure. Since Japanese and Korean can choose only a subject as an antecedent, Mr. Thin cannot be an antecedent in sentences like (13b), (14b).

If we assume that some of the Korean and Japanese learners transferred the structure of case marking of their native languages, the data in (7) and (8) can be explained by the Subset Principle. If the learners had chosen the smallest values in both parameters as children do in their L1 learning, the learners should have been able to pick Mr. Thin in both cases; however, because they transferred their L1 case marking structure, they failed to consider Mr. Thin as a subject in sentences with the control structure.

Of course, the value of the PAP could be transferred from their L1 because both Korean and Japanese have the smallest value in the PAP; however, we cannot determine whether the value is transferred or deduced from the Subset Principle.

5. Conclusion

Studies done by Broselow and Finer (1991), and Finer and Broselow (1986) are not enough to let us decide whether or not the learners have picked the intermediate value of the GCP. In order to make this decision, we need to test more complex structures such as Hirakawa's example below:

(15) [John says that [Mr. Fat asked Mr. Thin$_i$ [PRO$_i$ to paint himself$_i$]]].
    (Hirakawa   1990:67)

If the learners really pick an intermediate value, distinguishing tensed and untensed, they should not choose John as the antecedent. If we allow John to be the antecedent, it will lead us to conclude that the learners are just transferring their L1 value, i.e., the largest value of the GCP.

Counter to Broselow and Finer's (1991) proposal, other possibilities have been proposed in this paper; namely, the possibilities of the operation of the Subset Principle in adult SLA. If

we assume that difference in the learners' interpretation between tensed and infinitival structures comes from their L1 structures, the data possibly indicates that the learners have picked the smallest values in both parameters as the Subset Principle illustrates in first language acquisition.

From this study, we cannot make any claim about the availability of UG. Even if we assume that the Subset Principle still operates in SLA, it does not necessarily mean that UG is operating in SLA as in L1 acquisition because the Subset Principle is not a part of UG, but just assumes to interact with UG.

Of course, one could also argue that most of the learners have succeeded in resetting the GCP and transferred the value of the PAP from their L1. However, since the Korean and Japanese value of the GCP is the largest and English value is the smallest, it should be harder for the learners to constrain the values because they can constrain the values only by the negative evidence in this case. On the other hand, the Korean and Japanese value of the PAP is smaller than that of English. Thus, it should be easier for them to reset the parameter compared to the GCP because they can get the larger value only by positive evidence.

Thus, there are many possible ways to interpret the data in Broselow and Finer (1991), and Finer and Broselow (1986). As previously mentioned, there are several unclear points in their studies. In fact, when we consider both parameters (the GCP and the PAP) and the learners' native language structures, Broselow and Finer's conclusion—namely, that the learners have picked the intermediate value of the GCP—is not conclusive.

Notes

[1] "The starred columns list interpretations with subject control properties ..., and rowsintroduced by geminates show the native-language results, while rows KE, JE, HE showthe respective interpretations of English sentences by Korean, Japanese and Hindi subjects (the percentage figures reflect these rows). In addition, the columns headed by 'L' show the numbers of responses which reflected a local binder for the reflexive, and the columns headed by 'NL' show the number of non-local bindings. Not all sentences were responded by all subjects and so totals may differ from expectations". (Broselow and Finer 1991:53)

[2] Korean also seems to have the control structure since the same phenomenon can be observed in Korean, too.

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