

## Which One of Chomsky's Binding Theory and the Coargument-based Binding Theory: L2 Learner's Choice

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### ABSTRACT

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The ultimate goal of this paper is to provide a detailed analysis of L2 learners' acquisition of binding. It is worth noting that the L2 learners seem to support Chomsky's binding theory and the coargument-based binding, but they preferred Chomsky's binding theory to the coargument-based binding theory. In the case of local binding, 75% of the L2 learners entertained Chomsky's binding theory, whereas in the case of LD-binding, 60% of the L2 learners entertained the coargument-based binding theory. Chomsky's binding Theory consists of local binding and LD-binding. These are accounted for by the c-command condition and the governing category. The coargument-based binding theory is accounted for by the assumption that binding principle A applies between the coarguments of a predicate. In this paper, we carried out two surveys with respect to the two hypotheses. A pretest was performed without providing information about the two hypotheses. A posttest was performed after providing the two hypotheses. After this, we considered the SD and t-value. This paper argues that our t-value (2.036) is larger than 1.96, which in turn suggests that this t-value shows a meaningful difference between the pretest and posttest. This paper also argues that local binding was first acquired by the Korean learners of English, followed by LD-binding, c-command (overlapping reference), and the TSC, in that order. A major point to note is that learning difficulty arose and errors resulting from negative transfer occurred since Korean and English are not identical. A further point to note is that the L2 learners acquired less marked structures before more marked ones.

### Keywords:

L2 learning, acquisition, binding, principle A, principle B, binding theory, coargument-based binding theory

### 1. INTRODUCTION

The main goal of this paper is to provide a detailed analysis of L2 learners' acquisition of binding. We aim to consider the following: Which one of Chomsky's binding theory and the coargument-based binding theory do the L2 learners support? There are two influential hypotheses with respect to English binding. One hypothesis is advocated by Chomsky (Chomsky 1981, 1982, 1986, 1992, 1995), whereas the other hypothesis is advocated by Pollard and Sag (1992), Reinhart and Reuland (1993), Safir (2004), Reuland (2005, 2011), and Chamavel and Sportiche (2016). In this paper, we carried out two surveys with respect to the two hypotheses.

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A pretest was performed without providing information about the two hypotheses. A posttest was performed after teaching the two hypotheses. After this, we considered the following question: Do the L2 learners show a meaningful difference in the L2 learners' correct responses between the pretest and posttest. In order to observe this, we employ the SD and t-value. The organization of this paper is as follows. In section 2, we sketch out Chomsky's binding theory and the coargument-based binding theory. In section 4, in our experiment, we include nine sentences to evaluate the L2 learners' knowledge of binding. In section 5, we argue that our t-value (2.036) is larger than 1.96, which in turn indicates that this t-value shows a meaningful difference between the pretest and posttest. In section 6, we contend that local binding was first acquired by the Korean learners of English, followed by LD-binding, c-command (overlapping reference), and the TSC, in that order. Also, we contend that Chomsky's binding theory is the preferable one for them. In the case of local binding, 75% of the L2 learners entertained Chomsky's binding theory, whereas in the case of LD-binding, 60% of the L2 learners entertained the coargument-based binding theory. In this section, we maintain that as Ellis (2015) points out, where L1

and L2 are not identical, learning difficulty arises and errors resulting from negative transfer may occur. Finally, we argue that learners acquire less marked structures before more marked ones.

## 2. AN OVERVIEW OF TWO THEORIES

In Chomsky's (1981, 1982, 1986, 1995) binding theory, anaphoric relations between DPs are regulated by principle A and principle B. These principles are defined in terms of the c-command condition and governing category, as illustrated in (1):

### (1) Binding Theory

Principle A: An anaphor is bound in its governing category.

Principle B: A pronominal is free in its governing category.

Most importantly, an antecedent X binds an anaphor Y only if X c-commands Y. Thus, an antecedent must c-command its anaphor. According to Chomsky's binding principles incorporating c-command, reflexives and pronominals must be in complementary distribution, which appears to be supported by (2a) and (2b):

(2) a. Tom<sub>i</sub> is proud of himself<sub>i</sub>.

b. \*Tom<sub>i</sub> is proud of him<sub>j</sub>.

However, Chomsky's binding theory is far from complete, as alluded to in (3):

(3) That picture of himself<sub>i</sub> Tom<sub>j</sub> likes.

In (3), the antecedent *Tom* does not c-command the reflexive *himself*.

The coargument-based binding theory advocated by Pollard and Sag (1992), Reinhart and Reuland (1993), Safir (2004), Reuland (2005, 2011), and Chamavel and Sportiche (2016) is defined as follows:

(4) "A SELP anaphor must be bound by an eligible syntactic coargument. It is exempt if and only if it does not have such a coargument."

Chamavel and Sportiche (2016: 48)

As illustrated in (4), binding principle A applies between two arguments of a predicate. Let us consider (5):

(5) a. Tom saw a snake near himself.

b. Tom saw a snake near him.

Chomsky's binding Theory cannot account for the fact that as indicated in (5a) and (5b), anaphors and pronouns are not in complementary distribution. However, the coargument-based binding theory can explain why (5a) and (5b) are grammatical. In (5a), the reflexive *himself* does not function as an argument of the predicate *saw*. Thus, principle A is not applicable to (5a). In (5), the coarguments of *saw* are *Tom* and *a snake near himself*. Accordingly, anaphors and pronouns are not in complementary distribution, as indicated in (5a) and (5b).

## 3. METHODS

### 3.1. The Goals of Experiments

In this paper, we try to answer the following main questions: Did the L2 learners of English acquire the knowledge of English binding? Which theory do they support and acquire? Does L2 learning happens through transfer? Do they have the knowledge of local binding, LD-binding, overlapping reference, split antecedence, and c-command? Do they show a meaningful difference between the pretest and posttest? What do they show with regard to markedness?

### 3.2. Subjects

Twenty EFL college students participated in our experiment. These subjects are undergraduate students and they are attending my English conversation class (3 credits). We carried out two surveys in terms of Zoom. One survey was performed without providing information about the two theories (Chomsky's binding theory and the coargument-based binding theory). The other survey was performed after providing the two theories. We asked twenty students whether nine English sentences are grammatical or not.

## 4. RESULT 1

In our first experiment, we included (6) to assess the fact that the English anaphor *himself* lacks the property of subject orientation:

(6) John<sub>i</sub> told Bill<sub>j</sub> a rumor about himself<sub>i,j</sub>.

The L2 learners' correct responses to (6) were 75%, whereas their incorrect responses to (6) were 25%. This in turn indicates that 75% of the Korean learners of English acquired subject/object orientation in English binding. More importantly, the antecedent of the Korean anaphor *caki* 'self' must be the subject of a sentence. What this suggests that the English anaphor *himself* cannot be treated on a par with the Korean anaphor *caki* 'self'. It can thus be inferred that the L2 learning did not take place through positive transfer. It should be pointed out that Chomsky's binding theory explains the reason why the English anaphor can refer to *John* and *Bill*. Binding principle A predicts that the English reflexive *himself* is bound to *John* and *Bill* since *himself* is c-commanded by *John* and *Bill* in its governing category. However, the coargument-based binding theory cannot explain why (6) is grammatical. The coarguments of *told* is *John* and *Bill*, not *John*, *Bill*, and *himself*. Thus, the coargument-based binding theory misses the fact that the English anaphor *himself* can refer to *John* and *Bill*. Most importantly, that the L2 learners' correct responses to (6) were 75% suggests that they entertained Chomsky's binding theory rather than the coargument-based binding theory. It should be noted, however, that the L2 learners' incorrect responses to (6) were 25%. This in turn suggests that they did not acquired subject/object orientation and that they did not support Chomsky's binding theory. We thus conclude that nearly three fourths of the Korean learners of English supported Chomsky's binding theory and may have acquired it.

In our first experiment, we included (7) in order to evaluate the Korean learners' knowledge of local binding:

(7) John<sub>i</sub> thought that Bill<sub>j</sub> hated himself<sub>i,j</sub>.

John=himself, Bill=himself

The ungrammaticality of the binding of the English anaphor *himself* by *John*

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in (7) indicates that it lacks the property of LD-binding. Interestingly, the Korean anaphor *caki* 'self' allows LD-binding as well as local binding, as indicated in (8):

- (8) John<sub>i</sub>-i [Bill<sub>j</sub>-i caki<sub>j</sub>-lul miwehayssta]-ko sayngkakhayssta.  
 NOM NOM self-ACC hated-COMP thought  
 (John thought that Bill hated himself.)

The Korean anaphor *caki* 'self' refers to the matrix subject *John*. *Caki* 'self' can also refer to the embedded subject *Bill*. This indicates that *caki* 'self' is subject-oriented. This tells us that the English reflexive *himself* and *caki* 'self' are different in many aspects. Most importantly, the Korean learners' correct responses to (7) were 35%, whereas their incorrect responses to (7) were 65%. This in turn suggests that nearly two thirds of the L2 learners did not acquire the property of the local binding of *himself*. This may have happened through negative transfer. That is, an error may have taken place since the L2 learners thought of (7) as grammatical. It must be noted, however, that Chomsky's binding theory predicts that *himself* can refer to only *Bill* since the governing category for *himself* is the embedded sentence. On the other hand, the coargument-based binding theory can explain the reason why the English anaphor *himself* can refer to only *Bill*. The coarguments of the predicate *hated* is *Bill* and *himself*. Thus, both Chomsky's binding theory and the coargument-based binding theory can account for the ungrammaticality of (7). We thus conclude that nearly one thirds of the L2 learners entertained Chomsky's binding theory and the coargument-based binding theory.

In our first experiment, we included (9) in order to evaluate the L2 learners' knowledge of c-command:

- (9) \*Mary's brother criticized herself.

It is important to note that anaphors must be c-commanded by their antecedents. In (9), the English reflexive *herself* is not c-commanded by *Mary*, hence the ungrammaticality of (9). Likewise, the Korean reflexive *caki* 'self' must be c-commanded by its antecedent:

- (10) \*John<sub>i</sub>-uy nwui-ka caki<sub>i</sub>-lul piphanhayssta.  
 GEN sister-NOM self-ACC criticized  
 (John's sister criticized himself.)

The ungrammaticality of (10) is due to the fact that the Korean reflexive *caki* 'self' is not c-commanded by its antecedent *John* in this example. Most importantly, the Korean learners' correct responses to (9) were 55%, whereas their incorrect responses to (9) were 45%. This in turn shows that nearly half of the Korean learners of English acquired the c-command condition. It should be pointed out that the L2 learning may have happened through positive transfer. This stems from the fact that Korean and English share a commonality with respect to the c-command condition. It is interesting to point out that the ungrammaticality of (9) is predictable under Chomsky's binding theory and the coargument-based binding theory since the two theories require the c-command condition. It is thus reasonable to assume that more than half of the Korean learners supported the two theories.

Also, we included (11) to assess the L2 learners' knowledge of split antecedence:

- (11) \*Tom<sub>i</sub> told Mary<sub>j</sub> about themselves<sub>i+j</sub>.

It has been taken for granted that pronouns can take split antecedents, whereas anaphors cannot. More specifically, the English reflexive *themselves* cannot be bound by *Tom* and *Mary*. More interestingly, Chomsky's binding theory appears to be silent about the ungrammaticality of (11). Note that the English reflexive *themselves* is c-commanded by the antecedents *Tom* and *Mary*. Yet, coindexing *themselves* with *Tom* and *Mary* is not acceptable. However, the coargument-based binding theory is substantially different from Chomsky's binding theory. In (11), the coarguments of the predicate *told* is *Tom* and *Mary*, thus implying that the coargument-based binding theory correctly explains why (11) is ungrammatical. More interestingly, the L2 learners' correct responses to (11) were 60%. This in turn suggests that nearly two thirds of the Korean learners of English entertained the co-argument-based binding theory. We thus conclude that the L2 learners did not respect Chomsky's binding theory.

In our first experiment, we included (12) to evaluate our subjects' knowledge of LD-binding:

- (12) John told Mary that there were some pictures of themselves inside.  
 (13) John told Mary that there were some pictures of them inside.

As exemplified in (12) and (13), the English long distance reflexive *themselves* and the English pronoun *them* can have both *John* and *Mary* as their antecedents. In (12) and (13), the reflexive *themselves* and the pronoun *them* are not in complementary distribution. Thus, Chomsky's theory is far from complete as testified by (12) and (13). In addition, Chomsky's binding theory cannot explain the fact that (12) is grammatical. According to Chomsky's binding principle A, the governing category of *themselves* is the embedded clause. However, there are no antecedents that bind it in the governing category. Yet, the coargument-based binding theory clearly explains why (12) and (13) are both grammatical. In (12) and (13), the coarguments of *told* are *John* and *Mary*, not *John, Mary*, and *themselves*. In addition, there is no argument of the predicate *were* except *some pictures of themselves*. Thus, binding principle A is not applicable to (12). Most importantly, the L2 learners' correct responses to (12) were 60%, whereas their incorrect responses to (12) were 40%. This indicates that more than half of the Korean learners of English acquired LD-binding of English anaphors and entertained the coargument-based binding theory. According to Ellis (2015), learners acquire less marked structures before more marked ones. As expected, LD-binding is more marked than local binding. Thus, the L2 learners' learning difficulty may arise.

Also, we included (14) in order to evaluate the Korean learners' knowledge of the Tensed S Condition (TSC):

- (14) \*Tom thinks that himself is intelligent.

Unlike Korean reflexives, the English reflexive *himself* cannot occur in the subject position.

- (15) Tom-i caki-ka ttoktokhata-ko sayngkakhanta.  
 NOM self-NOM intelligent-COMP think  
 (Tom thinks that caki is intelligent.)

What this suggests is that English anaphors cannot be treated on a par with

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Korean reflexives. Thus, there may be no possibility of positive transfer between two languages since only Korean shows the absence of the TSC effect. Then, which theory do the Korean learners of English support? It should be noted that the two theories rule out (14). From the perspective of Chomsky's binding theory, let us take look at (14). In (14), there is no antecedent of *himself* in the governing category. Thus, (14) is ruled out as ungrammatical. On the other hand, there is only one argument in the embedded clause. Thus, (14) is ruled out as violating the coargument-based binding theory. Interestingly, the L2 learners' correct responses to (14) were 40%, whereas their incorrect responses to (14) were 60%. This may imply that the L2 learning may have happened through negative transfer. More specifically, the Korean learners may have thought of (14) as grammatical since the Korean sentence corresponding to (14) is grammatical. We thus conclude that 60% of the Korean learners of English supported neither Chomsky's binding theory nor the coargument-based binding theory.

In our first experiment, we included (16) to assess our subjects' knowledge of overlapping reference:

(16) John<sub>i</sub> said that they<sub>i+j</sub> went on a picnic.

Overlapping reference is one of the properties of pronominals. Neither Chomsky's binding theory nor the coargument-based binding theory can explain why (16) is grammatical. The English pronoun *they* refers to *John* and someone else as its antecedents. However, there is only one antecedent in the governing category, namely *John*. Thus, the two theories appear to be silent about (16). More interestingly, the L2 learners' correct responses to (16) were 55%, whereas their incorrect responses to (16) were 45%. This in turn indicates that more than half of the Korean learners of English acquired the knowledge of overlapping reference, but 45% of our subjects did not acquire it. This may have taken place since the English pronoun *they* can take overlapping reference. More specifically, in (16), the English pronoun *they* can be co-referential with both *John* and someone else in discourse. Thus, this structure is marked and learning difficulty arises. Ellis (2015) argues that learners acquire less marked structures before more marked ones. We thus conclude that 55% of the Korean learners of English supported neither Chomsky's binding theory nor the coargument-based binding theory.

In our first experiment, we included (17) to evaluate the L2 learners' knowledge of the coargument-based binding theory:

(17) Tom saw a snake near himself.

(18) Tom saw a snake near him.

It is worth pointing out that Chomsky's binding theory cannot explain the fact that in (17) and (18), the English reflexive *himself* and the English pronoun *him* are not in complementary distribution. According to Chomsky's binding theory, anaphors and pronouns are in complementary distribution. On the other hand, the coargument-based binding theory clearly explains why the English reflexive *himself* and the English pronoun *him* occur in the same position. To be more specific, the coarguments of the predicate *saw* are *Tom* and *a snake near himself*, not *Tom* and *himself*. That is, binding principle A is not applicable to this sentence, thus resulting in the grammaticality of (17) and (18). More interestingly, the L2 learners' correct responses to (17) were 70%, whereas their incorrect responses to (17) were 30%. On the other hand, their correct responses to (18) were 30%, whereas

their incorrect responses to (18) were 70%. From this, it is clear that in (17), 70% of the Korean learners of English entertained the coargument-based binding theory, whereas in (18), 30% of them supported it. It is interesting to point out that the Korean learners of English preferred anaphor binding to pronominal binding in (17) and (18). This in turn suggests that the L2 learners may have acquired anaphor binding before pronominal binding. It should be noted, however, that the L2 learners did not respect Chomsky's binding theory. It is thus reasonable to conclude that they entertained the coargument-based binding theory and that they acquired anaphor binding before pronominal binding.

### 5. RESULT 2

Before our second experiment, we introduced Chomsky's binding theory and the coargument-based binding theory to the Korean learners of English. In the case of Chomsky's binding theory, we introduced principle A and principle B to them. In the case of the coargument-based binding theory, we told the L2 learners that it applies between the coarguments of a predicate. It should be noted, however, that the L2 learners' correct responses to local binding (19 and 20) were 70% and 30%, respectively:

(19) John thinks Tom told James about himself.

Tom=himself, James=himself

(20) \*John thinks that Tom hates himself.

John=himself, Tom=himself

It should be pointed out that the percentage of their correct responses decreased compared with the pretest. However, there was a rise of 8.89% between the total pretest and the total posttest. Such a difference may have happened due to either Chomsky's binding theory or the coargument-based binding theory.

In our second experiment, we included (21) to evaluate the L2 learners' knowledge of the c-command condition again.

(21) John's sister pinched himself.

In the first experiment, the L2 learners' correct responses to the c-command condition were 55%, whereas in the second experiment, their correct responses to it were 80%. There was an increase of 25% between the pretest and posttest. It should be noted that the two theories require the c-command condition for local binding and LD-binding. It seems thus reasonable to conclude that 80% of the L2 learners supported the two theories.

However, the following sentence seems to suggest that Chomsky's binding theory is on the right track:

(22) John thinks that Tom told James about himself.

Tom=himself, James=himself

Chomsky's binding theory correctly explains why (22) is grammatical, but the coargument-based binding theory cannot. More specifically, Chomsky's binding theory rules in (22) since *Tom* and *James* c-command *himself* in the governing category for it. However, the coargument-based binding theory misses the fact that the English anaphor *himself* can refer to *Tom* and *James*. The coarguments of *told* are *Tom* and *James*, but they exclude *himself*. More interestingly, the L2 learners' correct responses to (22) were 70%, which

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indicates that 70% of the Korean learners supported Chomsky's binding theory. It should be pointed out, however, that there was a decline of 5% between the pretest and posttest.

In our second experiment, we included (23) to assess the L2 learners' knowledge of overlapping reference again.

(23) Mary said that they criticized Tom.

Neither Chomsky's binding theory nor the coargument-based binding theory can explain why (22) is acceptable. The English pronoun *they* can refer to *Mary* and someone else in discourse. It is interesting to note that there was a rise of 5% in the L2 learners' correct responses between the pretest and posttest. To be more specific, 60% of the Korean learners of English supported neither Chomsky's binding theory nor the coargument-based binding theory. In this case, there was no meaningful difference between the pretest and posttest.

In our second experiment, we included (24) to evaluate the L2 learners' knowledge of pronominal binding:

(24) \*Jack and Betti blamed them.

Jack and Betti=them

Chomsky's binding theory rules out (24) since the pronoun *them* cannot be bound to *Jack* and *Betti*. Binding principle B states that a pronominal is free in its governing category. On the other hand, the coargument-based binding theory predicts that two arguments of *blamed* are *Jack* and *Betti* and *them*, but it requires *themselves* to occur, which is ungrammatical. More interestingly, there is an increase of 10% (60% vs. 70%) between the pretest and posttest. This in turn shows that 70% of the Korean learners of English supported Chomsky's binding theory. Thus, it is reasonable to assume that there is a meaningful difference in the L2 learners' correct responses between the pretest and posttest.

In our second experiment, we included (25) to assess the L2 learners' knowledge of LD-binding:

(25) John told Mary that there were some pictures of them/themselves inside.

To begin with, Chomsky's binding theory cannot explain why (25) is grammatical. Chomsky's binding theory states that anaphors and pronominals are in complementary distribution. However, as illustrated in (25), the English pronominal *them* and the English anaphor *themselves* overlap in the same position, thus implying that Chomsky's binding theory is silent about (25). However, the coargument-based binding theory is exempt since in (25), the English reflexive *themselves* does not function as an argument of the predicate *told*. It is worth noting that 70% of the Korean learners of English supported the coargument-based binding theory. In the pretest and posttest, there was an increase of 10% with respect to the L2 learners' correct responses, which in turn suggests that there was a meaningful difference in the pretest and posttest. From this, it is clear that the L2 learners preferred the coargument-based binding theory to Chomsky's binding theory. If the percentage of the L2 learners' correct responses is low, we can think of it as indicating that they entertained Chomsky's binding theory. Note, however, that the L2 learners' correct responses to (25) were 70% and that Chomsky's binding theory cannot explain why (25) is

grammatical.

In our second experiment, we included (26a) and (26b) to assess the L2 learners' knowledge of the coargument-based binding theory:

(26) a. Tom saw a snake near him.

b. John saw a photograph of himself.

Chomsky's binding theory states that anaphors and pronominals cannot overlap in the same argument position. Yet, in (26a) and (26b), the English pronoun *him* and the English reflexive *himself* can occur in the same argument position. Again, Chomsky's binding theory wrongly predicts that they cannot occur in the same position. However, the coargument-based binding theory is exempt since the English reflexive *himself* is not bound by a coargument. Thus, binding principle A is not applicable to (26a) and (26b). It is noteworthy that in the pretest, the L2 learners' correct responses to anaphor binding were 70%, whereas in the posttest, their correct responses to (26b) were 75%. On the other hand, in the pretest, the L2 learners' correct responses to pronominal binding were 30%, whereas their correct responses to (26a) were 55%. This in turn shows that the Korean learners of English acquired anaphor binding before pronominal binding. In this case, there was a meaningful difference between the pretest and posttest.

Now attention is paid to the SD and t-value.

**Table 1 T-value**

	Pretest	Posttest	Difference
Student 1	66.66	77.77	11.11
Student 2	55.55	55.55	0
Student 3	33.33	33.33	0
Student 4	66.66	66.66	0
Student 5	55.55	88.88	33.33
Student 6	66.66	33.33	-33.33
Student 7	55.55	22.22	-33.33
Student 8	44.44	55.55	11.11
Student 9	77.77	66.66	-11.11
Student 10	44.44	66.66	22.22
Student 11	33.33	55.55	22.22
Student 12	55.55	77.77	22.22
Student 13	33.33	77.77	44.44
Student 14	55.55	33.33	-22.22
Student 15	55.55	44.44	-11.11
Student 16	55.55	66.66	11.11
Student 17	77.77	88.88	11.11
Student 18	44.44	44.44	0
Student 19	33.33	77.77	44.44
Student 20	55.55	55.55	0
Average	53.328	59.439	6.111
Standard deviation	13.424	19.009	21.507
Calculated t-value	2.036		

As indicated in Table 1, the difference in the L2 learners' correct responses between the pretest and posttest is 6.11. The SD of the pretest is 13.42 and

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that of the posttest is 19. T-value derived from the SD of the pretest, the difference in the students' correct responses between the pretest and posttest, and the number of the L2 learners is 2.036. This t-value provides the index about whether or not there was a meaningful difference between the pretest and posttest. The SD of the pretest indicates 53.32+13 or 53.32-13. On the other hand, the SD of the posttest indicates 59.43+19 or 59.43-19. Most importantly, our t-value (2.036) is larger than 1.96, which in turn suggests that this t-value shows a meaningful difference between the pretest and posttest. It can thus be inferred that both Chomsky's binding theory and the coargument-based binding theory were useful for the L2 learners. It is worthwhile noting that the average difference in their correct responses increased by 6.11 because of Chomsky's binding theory and the coargument-based binding theory. It is thus reasonable to conclude that our t-value (2.036) tells us that there was a meaningful difference in the L2 learners' correct responses between the pretest and posttest. So null hypothesis plays no role here.

### 6. DISCUSSION

In what follows, we aim to consider the order of the L2 learners' acquisition of binding. Also, we aim to consider which theory they prefer. In the pretest, the L2 learners' correct responses to local binding were 75%, whereas their incorrect responses to it were 25%. As illustrated in (27), the English reflexive *himself* can refer to *John* and *Bill*:

(27) John<sub>i</sub> told Bill<sub>j</sub> a rumor about himself<sub>ij</sub>.

In this case, the reflexive *himself* is locally bound to *John* and *Bill* in the governing category, hence the grammaticality of (27). As observed earlier, Chomsky's binding theory can explain why (27) is acceptable, but the coargument-based binding theory cannot. This in turn shows that in the case of local binding, 75% of the L2 learners entertained Chomsky's binding theory. Additionally, it should be pointed out that 75% of the L2 learners acquired local binding.

It is important to note that anaphors must be c-commanded by their antecedents, as indicated in (28):

(28) \*Mary's brother criticized herself.

In (28), the reflexive *herself* is not c-commanded by *Mary*, thus resulting in the ungrammaticality. More interestingly, the L2 learners' correct responses to (28) were 55%, whereas their incorrect responses to (28) were 45%.

It is significant to note that the English reflexive *himself* cannot appear in the subject position (the TSC effect):

(29) \*Tom thinks that himself is intelligent.

Interestingly, the L2 learners' correct responses to (29) were 40%, whereas their incorrect responses to (29) were 60%.

Now let us turn our attention to overlapping reference:

(30) John said that they went on a picnic.

The L2 learners' correct responses to (30) were 55%, whereas their incorrect responses to it were 45%. In (30), the English pronoun *they* can refer to *John*

and someone else in discourse. Most importantly, both Chomsky's binding theory and the coargument-based binding theory cannot explain why (30) is grammatical.

Now attention is paid to LD-binding:

(31) John told Mary that there were some pictures of themselves inside.

Interestingly, Chomsky's binding theory appears to be silent about (31). However, the coargument-based binding theory can explain why (31) is grammatical. Binding principle A is not applicable to (31) since *themselves* is not the argument of the predicate *were*. More interestingly, the L2 learners' correct responses to (31) were 60%, whereas their incorrect responses to it were 40%. This in turn implies that 60% of the L2 learners supported the coargument-based binding theory. Thus, our findings demonstrate that the L2 learners seem to support both Chomsky's binding theory and the coargument-based binding theory, but they prefer Chomsky's binding theory to the coargument-based binding theory. More specifically, in the case of local binding, 75% of the L2 learners entertained Chomsky's binding theory, whereas in the case of LD-binding, 60% of the L2 learners entertained the coargument-based binding theory.

Most importantly, the following graph shows the percentage of the L2 learners' correct responses to local binding, c-command, the TSC, overlapping reference, and LD-binding:

Figure 1 Order of the L2 learners' acquisition of binding

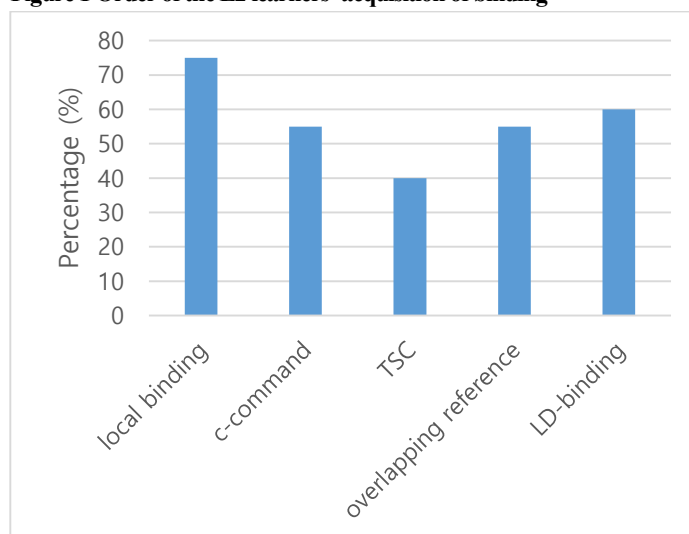


Figure 1 suggests that local binding was first acquired by the Korean learners of English, followed by LD-binding, c-command (overlapping reference), and the TSC, in that order. We thus conclude that local binding was the first acquired by them and that Chomsky's binding theory is the preferable one for them.

In what follows, we argue that as Ellis (2015) points out, where L1 and L2 are not identical, learning difficulty arises and errors resulting from negative transfer may occur. In the pretest, we included (32) to assess the L2 learners' knowledge of local binding:

(32) \*John thought that Bill hated himself.

John=himself, Bill=himself

In (32), the English reflexive *himself* can be associated with the embedded

subject *Bill*, but coindexing *himself* with the matrix subject *John* is not acceptable. However, the Korean anaphor *caki* 'self' can refer to *John* and *Bill*:

- (33) John<sub>i</sub>-i Tom<sub>j</sub>-i caki<sub>j</sub>-lul kwachanhayssta-ko malhayssta.  
 NOM NOM self-ACC overpraised-COMP said  
 (John said that Tom overpraised caki.)

More interestingly, the L2 learners' correct responses to (32) were 35%, whereas their incorrect responses to (32) were 65%. The reason why the percentage of the L2 learners' incorrect responses is high may be that the L2 learning may have happened from negative transfer. As Ellis (2015) points out, where L1 and L2 are not identical, learning difficulty arises and errors resulting from negative transfer can occur. In (32), the L2 learners may have thought of it as grammatical because of transfer.

Another case of negative transfer comes from the fact that the Korean reflexive *caki* 'self' can occur in the subject position:

- (34) \*Tom thinks that himself is intelligent.  
 (35) Tom-i caki-ka ttoktokhata-ko sayngkakhanta.  
 NOM self-NOM intelligent-COMP think  
 (Tom thinks that caki is intelligent.)

As alluded to in (34) and (35), the Korean anaphor *caki* 'self' cannot be treated on a par with the English anaphor *himself*. Interestingly, in the pretest, the L2 learners' correct responses to (34) were 40%, whereas their incorrect responses to (34) were 60%. Again, this may imply that the L2 learning may have taken place through negative transfer. That is, the Korean learners of English may have thought of (34) as grammatical since the Korean sentence corresponding to (34) is acceptable. We thus conclude that where L1 and L2 are not identical, learning difficulty arises from negative transfer.

In the following, we argue that as Ellis (2015) points out, learners acquire less marked structures before more marked ones. It is taken for granted that pronominals can have split antecedents, whereas anaphors cannot:

- (36) \*Tom<sub>i</sub> told Mary<sub>j</sub> about themselves<sub>i+j</sub>.

In (36), the so-called local reflexive *themselves* cannot be co-referential with *Tom* and *Mary*. Chomsky's binding theory wrongly predicts that (36) is acceptable since the reflexive *themselves* is c-commanded by the antecedents *Tom* and *Mary*. From this, it is clear that this structure is marked so that learning difficulty can arise. As observed earlier, in the pretest, 40% of the Korean learners of English did not acquire split antecedence. When it comes to an unmarked structure, things are different:

- (37) Tom saw a snake near himself.

The L2 learners' correct responses to (37) were 70%, whereas their incorrect responses to (37) were 30%. This in turn suggests that the L2 learners acquired the unmarked structure (37) before the marked structure (36). Thus, as Ellis (2015) points out, learners acquire less marked structures before more marked ones.

Another case of markedness stems from the fact that LD-binding impedes L2 learning:

- (37) John told Mary that there were some pictures of themselves inside.

Chomsky's binding theory cannot account for the fact that (37) is grammatical since there is no antecedent in the embedded clause. Yet, the English reflexive *themselves* can have both *John* and *Mary* as their antecedents, allowing split antecedence. More interestingly, the L2 learners' correct responses to (37) were 60%, whereas their incorrect responses to (37) were 40%. This in turn implies that 40% of the Korean learners of English did not acquire LD-binding. Conversely, local binding shows the opposite:

- (38) John<sub>i</sub> told Bill<sub>j</sub> a rumor about himself<sub>j</sub>.

In (38), the English reflexive *himself* can have *John* and *Bill* as its antecedents. Interestingly, the L2 learners' correct responses to (38) were 75%, whereas their incorrect responses to (38) were 25%. This in turn suggests that the L2 learners acquired local binding (38) before LD-binding (37). It seems thus reasonable to conclude that the Korean learners of English acquired less marked structures before more marked ones.

## 7. CONCLUSION

To sum up, we have provided a detailed analysis of the L2 acquisition of binding. In section 2, we have sketched out Chomsky's binding theory and the coargument-based binding theory. In section 4, we have argued that 75% of the Korean learners of English acquired subject/object orientation in English binding and that they supported Chomsky's binding theory. We have further argued that nearly two thirds of the L2 learners did not acquire the property of the local binding of *himself*. This may have happened through negative transfer. Also, we have maintained that nearly half of the Korean learners of English acquired the c-command condition. Additionally, we have contended that more than half of the Korean learners of English acquired LD-binding of English anaphors and that they entertained the coargument-based binding theory. Also, we have contended that 40% of the L2 learners acquired the TSC effect and that they supported Chomsky's binding theory and the coargument-based binding theory. We have argued, on the other hand, that more than half of the Korean learners of English acquired the knowledge of overlapping reference, but 45% of our subjects did not acquire it. We have further argued that 55% of the Korean learners of English supported neither Chomsky's binding theory nor the coargument-based binding theory. We have contended, on the other hand, that the L2 learners may have acquired anaphor binding before pronominal binding. In section 5, we have argued that our t-value (2.036) is larger than 1.96, which in turn suggests that this t-value shows a meaningful difference between the pretest and posttest. In section 6, we have contended that local binding was first acquired by the Korean learners of English, followed by LD-binding, c-command (overlapping reference), and the TSC, in that order. Also, we have contended that Chomsky's binding theory is the preferable one for them. In the case of local binding, 75% of the L2 learners entertained Chomsky's binding theory, whereas in the case of LD-binding, 60% of the L2 learners entertained the coargument-based binding theory. We have maintained that as Ellis (2015) points out, where L1 and L2 are not identical, learning difficulty arises and errors resulting from negative transfer may occur. Finally, we have contended that learners acquire less marked structures before more marked ones.

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- John=himself, Tom=himself
3. John's sister pinched himself.
  4. Mary believes that herself is smart.
  5. Mary said that they criticized Tom.  
Mary and someone else=they
  6. Jack and Betti blamed them.  
Jack and Betti=them
  7. John told Mary that there were some pictures of them inside.  
( )  
John and Mary=them
  8. John saw a picture of himself. ( )
  9. Tom saw a snake near him. ( )  
Tom=him

### A Survey

Write whether the following English sentences are grammatical or not.

1. John told Bill a rumor about himself. ( )  
John=himself, Bill=himself
2. John thought that Bill hated himself. ( )  
John=himself, Bill=himself
3. Mary's brother criticized herself. ( )
4. Tom thinks that himself is intelligent. ( )  
Tom=himself
5. Tom said that they went on a picnic. ( )  
Tom and someone else=they
6. Tom told Mary about themselves. ( )  
Tom and Mary=themselves
7. John told Mary that there were some pictures of themselves inside. ( )  
John and Mary=themselves
8. Tom saw a snake near himself. ( )  
Tom=himself
9. John saw a picture of him. ( )  
John=him

### A Survey

Write whether the following English sentences are grammatical or not.

1. John thinks that Tom told James about himself. ( )  
Tom=himself, James=himself
2. John thinks that Tom hates himself.