Pronoun Interpretation with Referential and Quantificational Antecedents in SLA

EUN HEE KIM
University of Illinois at Urbana-Champaign

1 Introduction

Natural languages make use of anaphoric expressions such as reflexives (e.g., *himself, herself*) and pronouns (e.g., *he/him, she/her*) whose interpretations are constrained by both grammar and context. It is not surprising therefore that some anaphoric expressions can be difficult for children to acquire. Many studies in native/first language (L1) acquisition have reported that while (English-speaking) children have knowledge that a reflexive must take a local (i.e., clausemate) antecedent by age three, they have problems in identifying the correct antecedent for pronouns within a sentence (e.g., Chien & Wexler 1990; Clackson, Felser & Clahsen 2011). Based on the findings in L1 acquisition research, a researcher in second language (L2) acquisition may ask if pronouns are difficult to acquire for the adult learners as well. This study aims to answer this question and evaluate one of the possible reasons for the difficulty – L1 influence.

Constraints on pronouns are different from those on reflexives. In (1), the pronoun *her* can refer to *Mrs. Johnson* but not *Megan* while the reflexive *herself* can refer to *Megan* but not *Mrs. Johnson*. This observation forms the basis of Principle A (Pr A) and Principle B (Pr B) of the Binding Theory (BT, Chomsky 1981), which requires a reflexive to have the same reference as another (c-commanding) NP in the same clause but prohibits a pronoun from doing so.

(1) Mrs. Johnson$_1$ said that Megan$_2$ painted her$_{1/*2}$ /herself$_{*1/2}$.

With regard to these constraints, there is an interesting asymmetry reported in L1 child langauge acquisition, known as the Delay of Principle B Effect (DPBE) (Clackson et al. 2011; Thorton & Wexler 1999; Van Rij, Van Rijn & Hendriks 2010). Children quickly learn that a reflexive must take a local antecedent in accordance with Pr A by the age of three, but they remain less accurate with Pr B that prohibits a pronoun from taking a local antecedent. A related observation is the Quantificational Asymmetry (QA). Many studies on DPBE have reported that children are likely to incorrectly choose a local antecedent for a pronoun when it is referential and not quantificational (*everyone, some students*) (Avrutin & Thornton 1994; Chien & Wexler 1990; Koster 1993). For example, Chien and Wexler (1990) found violations of the Pr B with children for (2a) but not for (2b) where the antecedent was a quantificational NP.

(2) a. Is Mama Bear touching *her*? (in the context of a picture of Mama Bear is touching herself)
b. Is every bear touching *her*? (in the context of a picture of every bear is touching herself)

Two representative accounts of these generalizations are the pragmatic account (Thorton & Wexler 1999) and the processing account (Reinhart 2006, 2011). Although the details of the two accounts are different, they agree that the reason why children have more problems in rejecting a local antecedent of a pronoun is due to the availability of accidental coreference between the pronoun and a local NP. As is well-known, there are two ways in which a pronoun can be linked to an antecedent. One is through variable binding, which is constrained syntactically (by Pr B), and the other is through coreference, which is free from structural constraints but is guided by pragmatics. Given that a pronoun taking a quantificational antecedent can only enter into variable binding, the fact that children have less problems disallowing a local quantificational antecedent for a pronoun (i.e., QA) implies that DPBE may be attributed to the accidental coreference between

the pronoun and the local clausemate NP. The reason why children are prone to more accidental coreference than adults may be attributed either to the lack of relevant pragmatic knowledge that specifies the contexts where the accidental coreference can be allowed or to the inability to choose the most appropriate antecedent among many candidates due to elevated processing costs.

Compared to L1 acquisition research, studies exploring pronoun acquisition in L2 are quite scarce. Moreover, those studies have found conflicting results in relation to adult L2 learners' knowledge of constraints on pronouns. Some studies found that adult L2 learners have the same comprehension difficulty reported in L1 literature with pronoun interpretation (Finer & Broselow 1986; Kim, Montrul & Yoon 2015; Lee & Schachter 1997), while others have found that the pronoun binding is unproblematic in L2 acquisition (Patterson, Trompelt & Felser 2014; White 1998). Finer and Broselow (1986) and Lee and Schachter (1997) investigated whether L2 learners' interpretation of pronouns is constrained by Pr B using offline judgment tasks, and found that L2 learners of English were incorrectly accepted local antecedents for pronouns. Kim et al. (2015) also reported that adult L2 learners' performance on real-time pronoun resolution was not nativelike when they tested them using a visual world paradigm eye-tracking experiment. By contrast, White (1998) found evidence against L2 learners having problems in nativelike pronoun interpretation. She conducted a study investigating Japanese-speaking and French-speaking L2 English learners' performance on English pronoun binding, and found that the L2 learners in her study were generally as accurate as the native speakers. Likewise, Patterson et al. (2014) found that German-speaking learners of English were not differerent from native speakers of English in their performance on an offline antecedent choice task and an online reading task.

Divergent results were reported even in a single study. Slabakova and White (2017) examined whether French-speaking and Spanish-speaking learners of English with various English proficiency have nativelike interpretation of English pronouns. In their experimental design, they manipulated two factors. The first factor was antecedent type (referential NP vs. quantificational NP) in order to see if the QA holds for L2 learners. They also manipualted pronoun type (full pronoun – *him* vs. reduced pronoun – *'m*) to investigate whether the L2 learners show an asymmetry between the full pronoun and the clitic-like reduced pronoun with respect to DPBE, something that has been reported in L1 acquisition literature (Hartman, Sudo & Wexler 2012)[1]. They found that advanced learners patterned similarly to

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[1] Children were more likely to show the apparent violation of Pr B with a referential antecedent when the pronoun was fully pronounced than when the pronoun was phonologically reduced.

native speakers of English in accurately rejecting the pronoun *him* which takes a local antecedent, regardless of antecedent types and pronoun types. On the other hand, intermediate learners showed a pattern similar to L1-English children, with a lower accuracy for pronouns with local referential antecedents than those with quantificational antecedents, and with full pronouns inducing more of these responses than reduced pronouns. The role of L2 learners' native language (French, Spanish) was also investigated, but was found not to play a significant role in the overall results.

With regard to the contradictory findings of the studies discussed above, an interesting pattern emerges. Difficulty with pronoun binding in L2 has been mostly observed in studies where participants have Korean as their native language. This raises the possibility that L1 does play a role in the pronoun interpretation in the target language, contrary to what Slabakova and White (2017) concluded, and that the role of L1 in L2 pronoun interpretation needs to be examined further. Previous L2 research has examined whether, and in what ways, the learners' L1 has an impact on the acquisition and knowledge of L2. The questions investigated ranged from the effect on L1 on the initial state of L2 acquisition (Schwartz & Sprouse 1996) to the impact L1 can have on ultimate attainment among near-native L2 speakers (Birdsong & Molis 2001). More recently, researchers have begun to explore whether L2 learners transfer processing strategies from their L1 during on-line processing in the L2 (Papadopoulou 2005). To my knowledge, however, the possibility of L1 transfer effect in pronoun interpretation has been addressed explicitly only in Slabakova and White (2017). Although they found no L1 influence on L2 pronoun interpretation among the speakers they tested, their conclusion needs to be tested with a variety of different L1's, in particular, with speakers of Korean whose binding system is more complicated, and where previous research has found possible interference of L1 in L2 pronoun interpretation. It is possible that L1 may play a role in the L2 interpretation of pronouns, at least for L1-Korean L2-English learners. This study aims to explore this possibility in a systematic way. This study investigated whether properties of Korean pronouns can influence Korean-speaking L2-English learners' interpretation of English pronouns. This was tested using an offline task which investigated the QA in the L2 acquisition of pronouns. As for the source of possible L1 influence, an overt pronoun in Korean (*ku 'he/him', kunye 'she/her'*) is assumed to be the source since it has been observed that a local binding of an overt pronoun is allowed easily with appropriate contextual cues (e.g., Choi 2013; Im 1998).

This pattern indicates that reduced pronouns are less capable of independent reference and hence must resort to binding, which in turn implies that they cannot take a local NP as antecedent.

2 Present Study

2.1 Research Questions, Hypotheses and Predictions

The present study addresses two issues: 1) the presence of the QA in L2-English pronoun acquisition 2) the role that the knowledge of Korean overt pronouns might play in the interpretation of English pronouns among L1-Korean L2-English learners.

The specific research questions of this study are presented below:

(3) a. Do L1-Korean L2-English learners interpret English pronouns differently from adult native speakers of English?
b. Do properties of Korean overt pronouns affect L1-Korean L2-English learners' interpretation of English pronouns?

Based on previous literature, I hypothesize that L1-Korean L2-English learners would interpret English pronouns differently from native speakers of English. It is predicted that L1-Korean L2-English learners would allow an English pronoun with a local antecedent when the antecedent is referential but not when it is quantificational, just like L1-English children. Regarding the second research question, I hypothesize that L1-Korean L2-English learners would transfer the properties of Korean overt pronouns to the interpretation of English pronouns. If this hypothesis is correct, it is predicted that L2 learners' responses to English pronouns would parallel their responses to Korean overt pronouns.

2.2 Participant

Two groups of participants were recruited for this study. One group was Korean-speaking learners of English (L2 group) and the other was native speakers of English (NS group) as controls. Both groups had thirty two participants (L2 – mean age = 26.69; NS – mean age = 20.11) and were drawn mostly from undergraduate/graduate students attending the University of Illinois. According to the language background questionnaire, most L2 participants began to learn English early (mean age of first English instruction = 8.78), primarily through public education in Korea. Many of L2 participants came to the US as an adult (mean age of arrival = 18.97) although there were some who moved to the US at earlier ages. L2 participants' English proficiency was measured using a separate cloze test[2]. Their mean cloze test scores were quite high and comparable to those of NS participants.

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[2] The text was adapted from American Kernel Lessons: Advanced Students' Book, by O'Neil, Cornelius and Washburn (1991); see Ionin and Montrul (2010) for further information about the cloze test.

Table 1 summarizes the results of the language questionnaire and the cloze test.

	L2 group Mean (SD)	NS group Mean (SD)
Male; Female	16; 16	18; 14
Age	26.69 (4.78)	20.11 (2.23)
Age of arrival	18.97 (7.53)	NA
Length of stay (year)	6.69 (4.03)	20.11 (2.23)
Age of first English instruction	8.78 (3.00)	NA
Cloze test scores	34.16 (2.37)	38.72 (1.94)

Table 1. Summary of language background questionnaire and cloze test

2.3   Design, Materials and Procedures

A Truth Value Judgment Task (TVJT – Crain & Thorton 1998) with story contexts was used to investigate the research questions of the study. In the task, participants read a short story and judged whether the target sentence, paired with the story, is TRUE or FALSE in the context of the story. In order to investigate the possible role of L1 transfer, L2 learners were tested twice in two different languages[3].

Each target biclausal sentence contains either a referential antecedent (proper name) or a quantificational antecedent (*every* NP for English TVJT; *enu* 'every' + NP for Korean TVJT), one occurring as the matrix subject and the other as the embedded subject, and an object pronoun (*him, her* for English TVJT; *kunye* 'her' for Korean TVJT[4]) in the embedded clause. Each story establishes a bias towards an interpretation of an object pronoun as taking either the embedded subject (yielding a local interpretation) or the matrix subject (yielding a long distance – LD – interpretation) as antecedent. Hence, two within-subject factors with two levels were crossed – a) type of antecedent – referential (name) vs. quantificational; and b) type of context – local (clausemate) binding vs. nonlocal (LD) binding. An example token set is given in Table 2, and the indexing expressed in the target sentence indicates which NP was targeted for the antecedent of the pronoun. For English TVJT, English names were used both in the stories and the test sentences while

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[3] Since I assumed that the properties of Korean overt pronouns may be the source of transfer, I needed an experimental design which can account for both L1 and L2 of L2 learners. Hence, the current design was used in this study.

[4] I used only *kunye* 'her' and never *ku* 'him' to prevent participants' misanalysis of *ku* as a demonstrative *ku* 'that', since the two forms are homophonous.

Korean names were used for Korean TVJT. The sample test sentences in Korean are given in parenthesis.

Sample story for local referential antecedent:
Sally, Megan and Tiffany go to the same school as Jessica. They do not like Jessica because they think she is too confident about herself. She always considers herself to be a great person, which they do not agree with at all. And Jessica has a rather poor opinion of the other girls, which does not help. One day, their teacher asked why the three girls do not like her and they explained why.

	Referential antecedent	Quantificational antecedent
Local (embedded subject)	a. Every girl said that [Jessica$_1$ thought highly of her$_1$]. (Enu sonye-na [Jessica$_1$-ka kunye$_1$-lul taytanhakey yekiessta]-ko malhayssta.)	b. Jessica said that [every girl$_1$ thought highly of her$_1$]. (Jessica-ka [enu sonye$_1$-na kunye$_1$-lul taytanhakey yekiessta]-ko malhayssta.)
Nonlocal (matrix subject)	c. Jessica$_1$ said that [every girl thought highly of her$_1$]. (Jessica$_1$-ka [enu sonye-na kunye$_1$-lul taytanhakey yekiessta]-ko malhayssta.)	d. Every girl$_1$ said that [Jessica thought highly of her$_1$]. (Enu sonye$_1$-na [Jessica-ka kunye$_j$-lul taytanhakey yekiessta]-ko malhayssta.)

Table 2. Sample target sentences for each condition

A TRUE response was interpreted to indicate that the intended reading of the test sentence based on the context was acceptable, while a FALSE response was taken to indicate that it was not allowed or was at least strongly dispreferred (Ionin 2010). For example, for (a), a response of TRUE would indicate that *him/her* is allowed to take a local referential antecedent, while a response of FALSE would indicate that the local binding interpretation of *him/her* is not available or strongly dispreferred.

Four different lists were used, with items counterbalanced using the Latin square design, and participants were randomly assigned to one of the lists. Each list contained sixteen target items (four tokens per condition) presented in a randomized order, interspersed with forty eight filler items, which included items with other quantifiers, negation, etc. The Korean TVJT was identical to the English TVJT, except that only the feminine form of the object pronoun (*kunye,* 'her') was used.

The NS control group completed the English TVTJ only, while the L2 group completed both English and Korean versions of the TVJT. There were

at least two weeks between the administration of the two tasks for L2 learners, and the order of testing was counterbalanced. Participants were asked to read the instruction carefully and go over the practice items before they began to complete the task to ensure that they understood what they were supposed to do. After the test, they were given a questionnaire about biographic information such as age, gender, and their daily language use. For analyzing the binomial data (TRUE or FALSE) of the TVJT, mixed effects logistic regression models with a binomial link function were employed. Two manipulating factors (antecedent type and context type) were included as fixed effects, and subjects and items as random effects. The models were built from the maximal random effect structure, following Barr et al. (2013).

3 Results

The mean accuracy rates of the nontarget items were calculated to ensure that the participants did not make random guesses. With both English TVJT and Korean TVJT, the rates were high (English TVJT – L2 = 87.65%, NS = 93.33%; Korean TVJT – L2 = 90.89%), suggesting that the participants were paying attention while completing the task.

Figure 1 shows the mean acceptance scores of each condition, which were calculated by assigning a score of 1 to TRUE response and 0 to FALSE response, and Table 3 summarizes the estimates of the statistical model for the two groups' performance on English pronouns. The model revealed a main effect of antecedent type, meaning that participants' responses for the referential antecedents and the quantificational antecedents were significantly different from each other. The model also revealed a main effect of context type, indicating that participants responded differently for the pronouns with local antecedents than for the pronouns with LD antecedents. A main effect of group, which I anticipated, was not found. However, interactions of 1) group and antecedent type and 2) group and context type were significant. *Post hoc* analyses were performed using Tukey tests. These revealed two things. First, the two groups were different in terms of how they responded to the pronouns with referential antecedents vs. those with quantificational antecedents. The L2 group showed the asymmetry between the two types of antecedents for both local binding ($z = -5.54$, $p < .001$) and LD binding ($z = -4.90$, $p < .001$) but the NS group did not (local binding – $p = 0.83$; LD binding – $p = 0.96$). L2 learners were more likely to allow referential NPs as antecedents of pronouns than quantificational NPs. Second, the two groups were different in their responses to local referential antecedents ($z = 5.37$, $p < .001$) and to LD quantificational antecedents ($z = -5.50$, $p < .001$). NS participants showed near categorical judgments in that they disallowed pronouns with local antecedents but allowed them with LD antecedents, which is a pattern consistent with Pr B. On the other hand, the

responses of L2 learners were not categorical. They allowed local referential antecedents to a greater degree than local quantificational antecedents. This is a result that is similar to the findings reported in L1 acquisition research and different from that of the NS control group. Furthermore, they showed nativelike performance with pronouns with LD referential antecedents but not with LD quantificational antecedents.
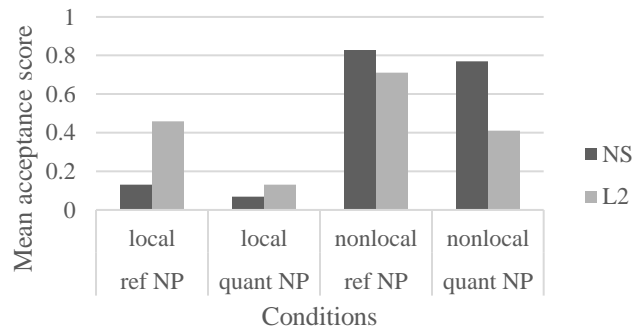

Figure 1. Mean acceptance scores of each condition in English TVJT

Fixed effect	Estimate	SE	z-value	p-value
Intercept	-1.94	0.28	-7.03	< .001
Group (NS)	-0.07	0.45	-1.60	0.11
Antecedent type (ref)	1.78	0.32	5.54	< .001
Context type (nonlocal)	1.54	0.32	4.80	< .001
Group * Antecedent type	-1.13	0.55	-2.08	0.04
Group * Context type	2.40	0.52	4.58	< .001
Antecedent type * Context type	-0.44	0.42	-1.06	0.29
Group * Antecedent type * Context type	0.15	0.69	0.22	0.83

Table 3. Fixed effects from the mixed effect model performed on participants' responses in English TVJT

I now turn to L2 learners' responses to Korean TVJT, which was administered to check the knowledge of overt pronouns in Korean. Figure 2 shows the mean acceptance scores of each condition in the Korean TVJT, and the summary of the statistical model is presented in Table 4. The model showed a significant main effect of antecedent type, indicating that participants were more likely to accept referential NPs than quantificational NPs as antecedents of overt pronouns in Korean. Also, there was a significant

interaction between antecedent type and context type. *Post hoc* pairwise comparisons were performed to see what contributed to the significant interaction. The results showed that there was a significant difference between referential antecedents and quantificational antecedents for local binding ($z = -3.69$, $p < .01$) but no such significant asymmetry for LD binding ($p = 0.42$). One thing that needs further discussion is that the mean acceptance scores hover around chance for the two conditions with quantificational antecedents. Given that the accuracy rate of the fillers in Korean TVJT was high and the participants were being tested about their native language, it cannot be the result of simple guessing. Instead, it may index how overt pronouns in Korean operate. I will turn to possible interpretations of the results in the next section.
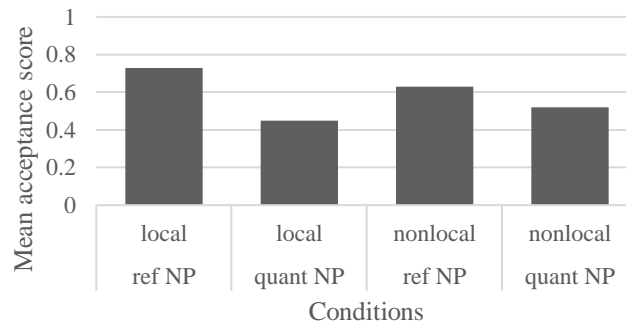

Figure 2. Results of Korean TVJT

Fixed effect	Estimate	*SE*	z-value	*p*-value
Intercept	-0.22	0.26	-0.85	0.40
Antecedent type (ref)	1.57	0.43	3.69	< .001
Context type (nonlocal)	0.35	0.28	1.23	0.22
Antecedent type * Context type	-0.93	0.41	-2.26	0.02

Table 4. Fixed effects from the mixed effect model performed on L2 learners' responses in Korean TVJT

In sum, the experimental results showed that for English TVJT, native speakers of English performed in line with Pr B but Korean-speaking learners of English did not. Unlike native speakers, L2 learners overaccepted English pronouns with local referential antecedents and underaccepted those with nonlocal quantificational antecedents. For the Korean TVJT, there was a referential/quantificational asymmetry for both local and nonlocal

antecedents, and the asymmetry was more pronounced in local than LD binding.

4   Discussion

The present study investigated L1-Korean L2-English learners' pronoun interpretation with various types of antecedents and explored the possibility that incorrect acceptance of pronouns with local antecedents may be due to L1 transfer from Korean overt pronouns. The experiment showed that the Korean speaking learners of English were different from native speakers of English in that they had problems in rejecting local referential, but not quantificational, NPs as antecedents of pronouns, just like L1-English children. Additionally, they showed difficulty with accepting nonlocal quantificational antecedents of pronouns, though they performed similarly to native speakers in the case of nonlocal referential antecedents. The second finding is interesting, and has not been reported in the previous literature. Together with the first finding, it implies that the L1-Korean L2-English learners do not find pronouns bound by quantificational antecedents to be very acceptable, regardless of binding distance (see Figure 1). This is puzzling since the participants I tested came out as advanced learners of English in the cloze test. A possible culprit is L1-Korean, where overt pronouns have been found not to be optimal when bound by quantificational antecedents (subject to the Overt Pronoun Constraint, OPC[5]), though there is uncertainty as to the strength of this tendency (Kang 1988; Noguchi 1997; Koak 2008). Regardless, if there is a preference not to construe overt pronouns as bound variables (due to L1 influence, I am hypothesizing), coupled with the fact that pronouns can be construed with local referential antecedents, there is a way to understand what my participants might have been doing. Recall that in the target statements (Table 2), there are two NPs – *every girl* and *Jessica* – that occur as either the embedded or the matrix subject. By the first finding we know that the L1-Korean L2-English learners allow coreference with referential antecedents regardless of binding distance. By the second finding, we know these speakers have a tendency not to allow bound readings of pronouns. Taken together, we can understand the results as follows. Local quantificational antecedents will be disallowed while local referential antecedents will be accepted (through coreference, I assume). In addition, there will be a difference between referential and quantificational antecedents in LD binding. Specifically when the quantificational NP is the matrix subject and the referential NP is the embedded subject, the preference

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[5] This constraint states that overt pronouns in *pro*-drop languages disallow a bound variable interpretation in situations where phonologically null pronouns are available (see Montalbetti 1984).

for coreference over variable binding might result in a number of responses where the learners (incorrectly) choose the local referential NP as antecedent. This may be the reason why the long distance interpretation of pronouns with quantificational antecedents is not as robust as that of referential antecedents.

As for the possibility of transferring the properties of Korean overt pronouns to the interpretation of English pronouns, my previous discussion suggests that it may exist, in the tendency of L2 learners to avoid having overt pronouns with quantificational antecedents. If the performance of Korean learners for English is reflective of their performance on Korean, there will be a tendency to disallow bound variable readings for overt pronouns in Korean, as in English. This means that we will find a referential/quantificational asymmetry and Pr B not effective for referential antecedents in Korean. The results of the Korean TVJT showed that these predictions were borne out. A referential NP was construed more easily as an antecedent of an overt pronoun than a quantificational NP, and a referential antecedent both inside and outside of the local clausal domain was allowed (see Figure 2). Moreover, as in the performance of L2 learners in the English TVJT, the acceptance of pronouns as quantificational antecedents in long distance binding was lower compared to referential counterparts reflecting a tendency to disallow overt pronouns construed as bound variables. Therefore, it is possible to see the results as being due to the knowledge of overt pronouns in Korean affecting the interpretation of English pronouns.

One interesting but unexpected finding in the Korean TVJT needs further discussion. If Korean speakers disprefer having an overt pronoun as a bound variable, we expect to find the degraded acceptance of an overt pronoun as a quantificational antecedent only in long distance binding. In other words, a quantificational NP is not predicted to be an antecedent of a pronoun if it occurs in the local domain, because the bound variable reading of a pronoun is constrained by Pr B and Pr B does not allow a local antecedent. However, in this study, the local reading of a pronoun was attested with a quantificational antecedent. One possible way to make sense of this finding comes from the general property of Korean as a discourse-oriented langauge. It has been claimed that Korean is one of the languages where discourse-pragmatic factors play much greater role than syntactic factors in language comprehension (Huang 1984; Kwon & Sturt 2013; H. Sohn 1980). That is, Korean allows discourse to override syntax. If it affects their performance on Korean in this study, the (grammatically incorrect) acceptance of locally bound overt pronouns by quantificational antecedents can be explained. The task in this study provided contextual cues and asked participants to make judgments of the given statement based on that context. In other words, strong pragmatic cues were given to establish the intended ungrammatical reading in the target statement. If the test subjects assign more weight to the

contextual cues than to the syntactic cues, they could choose the local quantificational NP as an antecedent of an overt pronoun which is not licensed syntactically. This may be the reason why the grammatically incorrect interpretation of an overt pronoun with a local quantificational antecedent is allowed to some degree.

To conclude, our experimental results showed that L1-Korean L2-English learners are different from adult native speakers of English in their performance on English pronouns with different antecedent types in varying binding distance. L2 learners were more likely to accept a local antecedent for an English pronoun when it is referential than when it is quantificational, just like L1-English children. Moreover, they showed a lowered acceptance of pronouns with nonlocal quantificational antecedents. Their non-nativelike performance seems to be attributed to their dispreference to allow a bound variable reading for an overt pronoun in Korean, which was observed in the experimental data of the current study on Korean.

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