EFL Korean Learners’ Use of Relative Clauses in Both Context-free and Context-rich Situations

Jaesuk Suh (Inha University)


The aim of this paper was to examine the knowledge of Korean students about English relative clauses in both contextualized and decontextualized situations. To this end, a study was conducted in which fifty college students of EFL participated as subjects, and data were collected by means of three methods: elicited imitation task, composition and conversation. The findings of the study indicated that subjects’ performance on comprehension and production tasks was affected by grammatical positions on which relativization occurs in relative clause. It was also shown that their performance was influenced by position of head noun in matrix clause that relative clause modifies. Based on the results of the study, two sets of ordering (i.e., the accuracy order of comprehension and the frequency order of production) in which a variety of types of relative clauses were understood and used in contextualized and decontextualized situations were offered to describe and explain the Korean learners’ performance on L2 relative clauses.

I. INTRODUCTION

Since Brown’s (1973) pioneering study of child language grammar in L1 research, a growing concern and interest in grammatical systems of L2 learners has prevailed constantly in the field of second language acquisition (Lightbown & Spada, 2007). Numerous studies have been undertaken to shed light on universality of L2 learning through an in-depth look at various grammatical aspects of learner language such as developmental patterns, errors, and learner strategies. One grammatical structure that has been researched in great detail, and has made considerable contributions to the search for universal principles underlying L2 learning is the relative clause (henceforth RC). Its unique forms and distinctive syntactic behaviors are sufficient to make RC become a focus
of study for linguistic, psychological or pedagogical purposes (Hawkins, 1989; Izumi, 2003; Tahriri & Sadighi, 2006).

A cursory glance at L2 literature on RC acquisition shows that previous RC studies have several notable characteristics in common in terms of the focus of investigation and research methodology (Diaz-Rico, 2004; Ellis, 1994). For many RC studies, a primary goal of their research was to examine learners’ knowledge of RC by determining the relative ease or difficulty of producing or processing various types of RC constructions. For this purpose, they preferred to look into performance samples gathered mainly by elicitation methods such as grammaticality judgment task (e.g., Doughty, 1991; Gass, 1978; Ioup & Kruse, 1977; Izumi, 2003), written sentence-combining task (e.g., Eckman, Bell & Nelson, 1988; Gass, 1978; Hamilton, 1994), or picture-mediated oral production task (e.g., O’Grady, Lee & Choo, 2003; Pavesi, 1986). While these elicitation instruments are known to tap intuitive grammatical knowledge of RCs in context-reduced situations, they offer very little information on knowledge of how to deal with RCs in context-embedded situations. In light of the current emphasis of L2 teaching profession on grammar teaching only with reference to situations (Celce-Murcia, 1991; Larsen-Freeman, 2001) and on spontaneous, genuine use of grammatical knowledge taught in such a way for communication, there is a clear, definite need for a systematic, in-depth study of RCs in context-embedded interactions in order to gain a complete picture of learners’ knowledge of RCs. Also another characteristic shared by many RC studies is that they are biased in favor of certain types of RC constructions assumed to be used frequently in everyday life (e.g., subject RCs and direct object RCs where relativization occurs on subject and direct object positions in the RC, respectively), and as a result, were negligent in other types of RC constructions such as indirect object RCs, object of preposition RCs and object of comparison RCs.

The aforementioned two notable characteristics of previous RC studies indicate that despite abundance of research on RC, it has not been treated in a systematic and comprehensive manner. So fully recognizing the status quo of existing RC studies, the present study tried to complement them by both collecting data from a variety of sources including conversation in which RCs were produced in open-ended, contextualized situations, and incorporating all types of RC constructions available to English native speakers into a data-gathering task. It was hoped that such an attempt would help to gain a better understanding of learners’ knowledge of RC in context-embedded as well as context-reduced situations. With those in mind, this study focused on investigating RC acquisition by Korean students of EFL, most of whom tend to experience considerable difficulty having a good command of RC in English. One root cause of such difficulties lies in ‘head parameter’ which specifies the position of a head noun in relation to RC within a noun phrase (Cook, 1993). According to head parameter, the Korean language
always has the RC before a head noun it modifies while the English language places the
RC after a head noun. On top of this, there is another source of difficulty impairing Korean
students’ successful RC acquisition in English. It involves the way in which Korean
students have been taught RCs in EFL classrooms. Very few people in this nation would
suspect that the most common, popular method to introduce and teach RCs in English
textbooks is a two-sentence combination. As an example, ‘Middle School English,’ the
nationally approved textbook for 8th graders, employs this method in which students are
given two sentences (e.g., ‘I like a banana’ and ‘My mother bought a banana yesterday’),
and are shown how two sentences are combined into one by way of a relative pronoun
‘which’ or ‘that’: ‘I like a banana which (that) my mother bought yesterday.’ Though this
way of handling the RC helps students know about basic rules relevant to the use and
formation of RCs, it does not appear to be effective and successful in leading students to
understand that a primary function of the RC is to modify a noun to give further, necessary
information on it, not to simply connect two sentences (Cook, 1993; Nakamori, 2002).
Furthermore, a two-sentence combination method does not adequately reflect the real and
authentic use of RCs in everyday communication. No one would create two sentences in
advance, combine them into one sentence using a relative pronoun within one’s mind, and
produce it in the real world where the stream of speech usually flows fast with few pauses
(Nakamori, 2002; Hinkel, 2006).

Given the notable differences between the Korean and the English languages in
relativization on the one hand, and the prevalent use of the ineffective, inappropriate
method for teaching the RC in EFL classes nationwide on the other, it is easily imagined
how much difficult and burdensome it would be for Korean students to be able to produce
and comprehend English RCs both accurately and fluently in and out of the classroom. So
this study attempted to determine in what ways and to what extent Korean students would
have trouble learning English RCs in EFL learning context with research questions
addressed as follows:

1. On which grammatical position of sentence do Korean students process the RC
   most accurately? Which type of RC constructions do they process most or least
   accurately?
2. On which grammatical position of sentence do Korean students produce the RC
   most often? Which type of RC constructions do they produce most or least
   frequently?
II. PREVIOUS STUDIES ON L2 RC ACQUISITION

Previous studies of RC acquisition in the literature can be categorized roughly into two groups. The first group of studies deals with claims or hypotheses about the relative ease or difficulty of producing and processing various types of RC constructions. Perhaps Keenan and Comrie’s (1977) Noun Phrase Accessibility Hierarchy (henceforth NPAH) is best-known and most influential in making systematic predictions on RC acquisition. It originates from typological universals, and states that among six positions on the NPAH (i.e., subject, direct object, indirect object, object of preposition, genitive and object of comparison), subject position is most accessible for relativization while object of comparison position is least accessible for relativization (Braidi, 1999). Kuno (1974) was concerned about the relationship between syntactic patterns and language processing. It was claimed that center embedding which places a dependent clause in the middle of sentence interferes with the processing of a matrix sentence largely due to short-term memory limitations, and becomes perceptually harder to process than right or left embedding with no such interrupting element. Based on the findings of her study with children learning English as L1, Sheldon (1974) addressed the parallel function hypothesis that RC constructions such as Subject-Subject (SS) and Object-Object (OO) types (the first character represents the grammatical function of head noun in the matrix clause, and the second character stands for the grammatical function of extracted noun in the RC) are easier to produce or comprehend than RC constructions like Subject-Object (SO) and Object-Subject (OS) types where no parallel grammatical function of nouns exists in both the matrix and the relative clause.

Meanwhile, Hamilton (1994) and O’Grady (1999) explained RC acquisition in terms of internal structure of the RC. Hamilton (1994) centered on the notion of processing discontinuity, and saw it as something impairing the successful processing of RC constructions. He identified two kinds of processing discontinuity such as center-embedded RCs and syntactic nodes of sentential or phrasal boundary separating a relative pronoun from an extracted noun in the RC. He kept arguing that the more processing discontinuity a sentence has, the more difficult it will be to process. Since Object-Subject (OS) type has only one processing discontinuity like sentential boundary between a relative pronoun and an extracted noun, it should be easier to process than Subject-Object (SO) type which has three processing discontinuities such as center embedding RC, verb phrasal and sentential boundaries. O’Grady (1999) was similar to Hamilton (1994) in that RC processing difficulty is determined by the distance between a relative pronoun and an extracted noun in the RC. The distance here is measured in terms of interrupting syntactic nodes such as phrase or sentence, so the degree of processing difficulty in a given RC is in
proportion to the number of intervening nodes between the two nouns. Thus, RC constructions such as SS or OS types are expected to be easier to process than RC constructions like SO or OO types since the former has only one intervening node (i.e., sentence) while the latter possesses two intervening nodes (i.e., verb phrase and sentence).

The second group of studies on the RC includes empirical studies which either tested the claims or hypotheses about RC processing, or examined RC acquisition by L2 learners to establish an order of learning difficulty of various types of RC constructions. Despite differences among studies in the focus of investigation, data-gathering methods and subjects involved, many studies offered strong evidence in support of Keenan and Comrie’s (1977) NPAH Hypothesis (Izumi, 2003). For instance, Gass (1978) was among the first to show that ESL learners with various L1 backgrounds produced relativization on positions high on the NPAH more accurately than relativization on positions low on the NPAH on a sentence-combining task. Pavesi (1986) compared formal and informal learning by EFL Italian learners, and reported that overall, subjects in both learning contexts learned how to relativize in the order predicted by the NPAH Hypothesis. Hawkins (1989) was also able to show a close link between the order of learning difficulty and the hierarchical order typologically determined by the NPAH when English learners of French were asked to engage in a cloze task requiring the provision of appropriate relativisers in various sentences. Likewise, Park (1999) instructed Korean students in middle and high schools to make various RC constructions in sentence-combining task, and found the close relationship between degrees of accuracy of RC constructions and six positions of relativization on the NPAH. In addition, Eckman, Bell and Nelson (1988), and Doughty (1991) were all concerned about the implicational markedness relationship on the NPAH for pedagogical purposes, and examined learners’ capacities to generalize from more marked relativization into less marked relativization. That is, after being taught more marked relativization (i.e., relativization on positions low on the NPAH), subjects in the two studies were able to generalize this learning into less marked relativization (i.e., relativization on positions high on the NPAH), not vice-versa. Finally, O’Grady, Lee and Choo (2003) looked into comprehension ability of American learners of Korean through a picture-selection task, and reported that their subjects performed much better on relativization on subject position (i.e., SS or OS types) than relativization on object position (SO or OO types).

On the other hand, some studies lend support to Kuno’s (1974) Perceptual Difficulty Hypothesis. In an effort to establish an order of learning difficulty among four types of RC constructions (i.e., SS, SO, OS, and OO types), Ioup and Kruse (1977) found that a pair of OS and OO types without center embedding had much less errors than any other pair of RC constructions. Schumann (1980) looked into ESL learners’ use of RCs in a longitudinal study over a ten-month period, and showed that relativization on object
position was produced more accurately and more often than relativization on subject position. Similarly, in a study with ESL learners with twelve native languages, Izumi (2003) found that in general, subjects were able to produce and process OO or OS types without center embedding more accurately than SS or SO types with it on sentence-combining and interpretation tasks. In the meantime, few studies if any have offered evidence for Sheldon’s (1974) parallel function hypothesis in both L1 and L2 research (Doughty, 1991).

In sum, the survey of the literature on the RC reveals that despite an extensive number of studies, little consensus is available among researchers as to RC acquisition, and mixed, inconclusive results of studies may lead to unclear, confusing interpretations. This demonstrates that RC acquisition is a complex task involved in various factors such as universal principles of the RC, L2-specific features, and L1 influence, among others (Gass, 1978), so that it is difficult to explain with any single theory or hypothesis in a clear-cut way. Nonetheless, it is true that part of mixed and inconclusive results of RC studies can be traceable to problems of conducting research such as use of inappropriate data-gathering method and bias in data collection process. So keeping this in mind, the present study tried to differ from previous studies in the way of data collection and the focus on all types of RC constructions accessible to target language speakers, and to get closer to a whole picture of RC acquisition by Korean learners of EFL.

III. METHODS

1. Participants

The subjects of the study were fifty Korean students of EFL. They were undergraduate students who were enrolled at one of the major universities in Korea. At the time of study, they were taking a course entitled “Practical English Grammar” whose aim was to help students gain a better understanding of English grammar through using it in various contexts for communicative purposes. All subjects majored in either English education or English language & literature. They were sophomores, and about two thirds of them were female. Self-rated English proficiency ranged from intermediate-low to advanced level. According to background information collected at the beginning of study, most subjects had learned English grammar mainly through explicit instruction by teacher and text reading with no reference to situations, and had been given few chances to apply their knowledge into communicative contexts. Their tedious and boring experience with such grammar learning seemed to lead many subjects to take the present course in which a
variety of interactive activities were ready to encourage students to use target grammar items for communication in context.

2. Instruments and Procedure

Three different methods were used to gather data in the study. They were elicited imitation task, composition and conversation. In elicited imitation task, subjects were asked to listen to sentences containing various types of RC constructions, and write down everything that they heard in a given sentence. As stated before, unlike many previous RC studies which focused mainly on subject RCs and direct object RCs, this study included all the types of RC constructions available in the English language. That is, given that any type of RC construction is a sentence in which a head noun placed in each one of the six positions (i.e., subject, direct object, indirect object, object of preposition, genitive and object of comparison) of a matrix clause is modified by the RC in which relativization occurs on each one of the same six positions, all together, thirty six different types of RC constructions were created as input sentences (See Appendix). Individual input sentences were ordered to make sure that adjacent pairs of sentences should not be overlapped in terms of positions on which relativization takes place in the RC. During the task, all sentences recorded by an English native speaker were spoken out only once, and a two-minute time interval between any two sentences was given in order for the subjects to have sufficient time to write down what they heard on a given sheet of paper. They were told that for an accurate measure, they were not permitted to take notes while listening.

While the elicited imitation task was administered during the class period, composition and conversation tasks were conducted in the form of assignment. For composition assignment, first, the subjects were asked to select one of the five topics such as ‘Historical figures I respect,’ ‘Favorite TV shows,’ ‘My hometown,’ ‘Kind of people I like or avoid,’ and ‘Person whom I want to marry.’ Then they were given homework in which they should do one-page-long writing in English about a selected topic, keeping in mind that they should use RCs in their writing whenever necessary. For conversation assignment, the subjects were given a topic, i.e., ‘important, interesting inventions made in 20th century.’ They were told that for the completion of assignment, they should work in pairs for interaction, and have a five-to-ten minute conversation about the topic. They were also instructed to tape-record their conversation, and transcribe it as accurately as they could for a later submission. As in composition assignment, they were reminded that they were strongly encouraged to use as many RCs as possible during conversation. One advantage of gathering data through conversation is that in open-ended discourse contexts, subjects were expected to experience interactive nature of everyday communication, and organize conversation in their own way, which would allow them to use RCs at their disposal, not
to mention the exchange of naturally occurring speech (Houck & Gass, 1996).

3. Data Analysis

Subjects’ responses to three differing data-gathering methods yielded two types of data: comprehension data from elicited imitation task and production data from composition and conversation tasks. Since the focus of the study was on subjects’ knowledge about the RC in L2, the first step to analyze data was to identify all sentences or utterances containing RCs in both types of data, and determine if each one of them could stand alone in that it transmitted an independent meaning successfully. Because there were sometimes cases in which a given sentence or utterance including the RC looked grammatical, but was uninterpretable, it was thought to be appropriate to exclude such an erroneous sentence from data analysis. Then for comprehension data, scoring was done on the basis of the assumption that RC acquisition in English needs the knowledge of such sub-components of relativization as choice of relative pronoun, pronoun retention, adjacency of head noun to the RC, agreement of head noun with verb in the RC, and case marking on relative pronoun (Gass, 1978; Schachter, 1974). These five sub-components of relativization were used as scoring criteria, each of which was assigned one point. So when a certain sentence or utterance containing the RC was grammatically well-formed in terms of five scoring criteria, it was given five points.

To answer research question 1 (i.e., On which grammatical position of sentence do Korean students process the RC most accurately? Which type of RC constructions do they process most or least accurately?), all identified RCs were classified into six categories in terms of six positions on Keenan and Comrie’s (1977) NPAH, and were rated according to the scoring procedure. Then score on each RC in a given category was summed, and the resulting total score in individual categories was compared with one another through a statistical technique, ANOVA with the level of significance set at .01. Meanwhile, to answer research question 2 (i.e., On which grammatical position of sentence do Korean students produce the RC most often? Which type of RC constructions do they produce most or least frequently?), all RCs produced during composition and conversation tasks were also classified in terms of six positions on the NPAH, and the frequencies with which relativization occurred on each one of the six positions were counted for a later comparison. Further, the frequencies with which various types of RC constructions were formed during the two production tasks were also counted in order to determine the highest and the lowest occurrence of RC type.
IV. RESULTS

1. Comprehension Ability of Korean Students to Process the RC

The analysis of data from the elicited imitation task designed to measure the subjects’ comprehension ability to process RCs revealed a clear effect of position on relativization on the comprehension of RCs.

**FIGURE 1**
Processing of RCs on Six Positions of the NPAH

![Graph showing comprehension scores for different positions of RCs](image)

**Legend:**
- Scores of RCs on six positions (raw score)

*cf) Sub = Subject, DO = Direct object, IO = Indirect object, OP = Object of Preposition, Gen = Genitive, OC = Object of Comparison*

As seen in Figure 1, the most accurately processed RC constructions are sentences containing subject RCs. Direct object RCs ranked second while object of comparison RCs ranked the last as the least accurately processed RC constructions. Though a one-way ANOVA showed no statistically significant differences among scores on RCs in six positions (F = 1.334, p = .276), it is obvious that the subjects’ comprehension of RCs was affected by the grammatical positions on which relativization occurs inside the RC to a considerable extent. Further except for positions of indirect object and genitive, scores of RCs on the other four positions (i.e., from subject to object of comparison) tend to decrease gradually, which is reminiscent of the NPAH Hypothesis, and is in line with the results of many previous studies (e.g., Gass, 1978; Doughty, 1991; Izumi, 2003). A high performance on genitive RCs was surprising, and may be due in part to the fact that genitive RCs are differentiated from other RCs in form and behavior, which makes them salient and notable, and thus facilitates their overall comprehension. Conversely, a poor performance on indirect object RCs was unexpected, and might be accounted for by infrequent use of them in the subjects’ grammar-oriented EFL classes. Though it seems that little exposure to indirect object RCs does not always interfere with translation or...
reading activities in serious ways, it would give much hard time to the subjects during comprehension who had been given few chances to produce or hear indirect object RCs in any meaningful ways, and consequently, had not made themselves familiarized to them in and out of the classroom.

In addition to positions on which relativization occurs in the RC, there is still another factor influencing successful processing of RC constructions. It involves position of head noun in a matrix clause that the RC modifies. This can be one main reason why sentences having relativization on the same position in the RC are processed differently, causing the differing degree of comprehension difficulty (Tahriri & Sadighi, 2006).

**TABLE 1**

<table>
<thead>
<tr>
<th>Processing of RCs by Six Positions of Matrix Clause (raw score)</th>
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<tr>
<td>Sub</td>
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</tr>
<tr>
<td>Sub</td>
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<td>DO</td>
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<td>Gen</td>
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<td>OC</td>
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</table>

A horizontal axis refers to identical nouns in the RC, and a vertical axis indicates identical nouns (head nouns) in the matrix clause.

In Table 1, among subject RCs, the Korean learners comprehended RC constructions most accurately when the head noun in the matrix clause is in direct object position. The second most accurately comprehended RC constructions are those in which the head noun in the matrix clause is in subject position. Such is also the case for both direct object RCs and indirect object RCs. However, the opposite is true for object of preposition RCs, genitive RCs and object of comparison RCs. Here the RC constructions whose head nouns in the matrix clause are in subject position were processed more accurately than the RC constructions whose head nouns in the matrix clause are in direct object position.

Looking at RC constructions in terms of both horizontal and vertical axes in Table 1, it becomes evident that there exists an accuracy order of comprehension among a variety of different types of RC constructions. This is true especially when considering four most accurately comprehended RC constructions such as Direct object-Subject (OS), Direct object-Direct object (OO), Subject-Subject (SS) and Subject-Direct object (SO) (Direct object here is written as O for the sake of clarity and comparability with previous studies). In these four selected types of RC constructions, OS type was comprehended most accurately, which was followed by OO type. SO type was comprehended least accurately among the four types. Then the accuracy order, OS > OO > SS > SO (‘>’ means ‘comprehended more accurately’), seems to show evidence for the active role of center-
embedding in the Korean subjects’ processing of RC constructions. As mentioned before, center-embedding inserts the RC in the middle of the matrix clause, so that a newly embedded RC interrupts the flow of meaning of the matrix clause, and moreover, requires language users to process and store information of the embedded RC until they finish the processing of the remaining part of the whole sentence. Hence, it may be the case that center-embedded RCs overloaded short-term memory system of the Korean learners, caused serious perceptual difficulties, and had a negative effect on their RC processing (Kuno, 1974). In the meantime, the differences in comprehension between OS and OO types on the one hand and between SS and SO types on the other can be understood by either Hamilton (1994) or O’Grady (1999). According to Hamilton (1994), since sentential or phrasal boundary between a relative pronoun and an extracted noun in the RC creates processing discontinuity, and since the number of such boundaries is in inverse relationship with RC processing, OS or SS type which includes one sentential boundary has less serious processing discontinuity, and must have been easier for the subjects to comprehend than OO or SO type which contains two boundaries (i.e., sentential and verb phrasal).

2. Production Ability of Korean Students to Use the RC in Context

The analysis of production data indicated that a total of 616 RC constructions were used: 265 RC constructions in composition and 351 RC constructions in conversation. In light of the fact that there is usually more time available for preplan in writing than in face-to-face interaction, the subjects were supposed to produce more RC constructions in composition than in conversation. But such was not the case, and the overuse of RC constructions in conversation can be clearly seen in such various RC types as SS, OO, SO and PS types, among others in Table 2 (As in the previous section, Direct object is represented as O). However, a careful look at data revealed that RC constructions used in conversation tended to be shorter in length and simpler in meaning than those in composition. It is possible that when the subjects felt that message to be transmitted during conversation was rather simple and clear, they might have decided to readily map it onto the RC while knowing unique differences between spoken and written language in use as communication tools, they tried to make their writing look coherent and logical by avoiding too simple sentences and redundancy, and at the same time, combining several short sentences into one long sentence using various grammatical devices including the RC. Thus simplicity and clarity of message being transmitted and notable differences between spoken and written language in communicative use were likely to combine to result in the unbalanced production of RC constructions between conversation and composition.
TABLE 2
Number of RC Constructions Used in Conversation and Composition

<table>
<thead>
<tr>
<th></th>
<th>SS</th>
<th>DS</th>
<th>PS</th>
<th>SD</th>
<th>DD</th>
<th>PD</th>
<th>SP</th>
<th>DP</th>
<th>PP</th>
<th>SG</th>
<th>DG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Con</td>
<td>70</td>
<td>135</td>
<td>60</td>
<td>19</td>
<td>41</td>
<td>10</td>
<td>0</td>
<td>11</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Comp</td>
<td>44</td>
<td>141</td>
<td>30</td>
<td>9</td>
<td>20</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>114</td>
<td>276</td>
<td>90</td>
<td>28</td>
<td>61</td>
<td>12</td>
<td>2</td>
<td>17</td>
<td>7</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

cf) S = Subject, D = Direct object, P = Object of Preposition, G = Genitive, Con = Conversation, Comp = Composition

According to Table 2, all the positions on which relativization occurred in two production tasks included subject, direct object, object of preposition and genitive positions. Among them, subject and direct object were two most frequently relativized positions (581 times of occurrence), which accounted for 94% of a total occurrence of relativization in production. To the contrary, relativization on the other positions, object of preposition and genitive, was infrequent, and uncommon while no relativization was attempted on positions of indirect object and object of comparison. The overall sharp decrease in the occurrence of relativization on from subject to genitive positions reflects what the Keenan and Comrie’s NPAH Hypothesis predicts, and indicates the Korean learners’ strong preference for subject RCs and direct object RCs over other RC types during production.

A close look at relativization on subject and direct object positions made it easy to identify frequently produced RC constructions such as DS, SS, DD and SD. These four types of RC constructions represent the frequency order of production, OS > SS > OO > SO (‘>’ means ‘produced more often.’ Direct object is also written as O.), in which they were employed in the two production tasks except for PS type. In light of the fact that PS type is quite similar to OS type in that it takes object in the matrix clause, and has subject RC on the right side of the matrix clause, PS type can be incorporated into OS type with no change in the above order, and the resulting coalesced OS type would still be the most frequently produced RC type. The frequency order of production can be accounted for by O’Grady (1999) according to which OS or SS type with one intervening node (i.e., sentence) is expected to be easier to learn and use than OO or SO type with two intervening nodes (i.e., verb phrase and sentence). One thing of interest here is that SS type was placed as the second most frequently used RC type, and was produced more often than OO type despite the presence of center-embedded RC in the matrix clause. A brief look at SS type of RC constructions in data showed that overall, messages in the RC tended to be clear and transparent, and their length (i.e., the length from the beginning and the end of the RC) was rather short as compared to other types of RC constructions. The following are some examples of showing such characteristics of SS type in production data:
All the students who attend University take classes on the Internet. (subject #2 in conversation)

Novel who invented dynamite established the prize named a Novel prize after his name. (subject #5 in conversation)

The people who like to talk don’t consider my feeling, and always tell their own story. (subject #19 in conversation)

A person who leads me has to be next to me in our marriage life (subject #22 in conversation)

A person who is violent cannot be a good husband. (subject #45 in composition)

The high occurrence of SS type appears to link to the way of gathering data in production. Since the subjects were required to produce as many RCs as possible in their assignment, they must have been under much pressure to complete it, and have probably turned to RC constructions which could be handled easily and quickly. One such RC type was OS type that has canonical word order (i.e., SVO) in both the matrix clause and the RC, and thus has few barriers to the overall successful sentence production. As the next choice of RC type, the subjects were shown to select SS type possibly with the intention that they had to overcome or control over difficulties arising from center-embedded RC in effective, clever ways. As one major way to realize such an intention, they must have decided to center on clarity and simplicity of message to be transmitted inside the RC. That is, whenever there was a situation in which they perceived message of the RC as simple and straightforward, they must have been quick to map it onto the form of SS type. Therefore, the overuse of SS type during conversation and composition may be the results of an artifact of the data collection method employed in the study (Izumi, 2003).

At this moment, one question that can be raised is why the subjects showed a strong preference for SS type over SO or OO types. Both SS type and SO type are the same in having center-embedded RC in the middle of sentence. They also require language users to engage in the same psychological process of relativization in which they need to keep a relative pronoun in short-term memory until they find a right place for it in the RC. The place in the RC where an identical noun is extracted, and should be interpreted or filled by a relative pronoun in relativization is known as a gap-filler, and the distance between a relative pronoun and a gap-filler in the RC can be seen as critical in determining the degree of difficulty of RC acquisition (Kluender, 1998; O’Grady, 1997). In other words, the more a relative pronoun is separated from a gap-filler, the more difficulty of processing or production of a given RC would be created. In light of this view of relativization, SO type must have been more difficult to handle than SS type for the Korean subjects since SO type forces them to move all the way back to the end of sentence to search for a gap-filler, and at the same time, to hold a relative pronoun in memory much longer than SS type.
which allows them to get a gap-filler right after keeping a relative pronoun in memory. Likewise, in the case of OO type, though it does not contain center-embedded RC in it, it requires a longer storage of a relative pronoun in memory during the search for a gap-filler inside the RC than SS type. The finding that OO type was produced far less often than SS type indicates that the Korean subjects must have been more sensitive to psychological burdens or difficulties created by mental journey to search for a gap-filler than by center-embedding, and have preferred SS type to OO type. As stated above, this must have been possible due to their strategy to only map simple, transparent messages onto the RC form, and thus to reduce some amount of difficulties they should have experienced in the production of SS type.

V. DISCUSSION

The results of RC processing on the elicited imitation task offered several things of interest that deserve attention. First, the subjects comprehended RCs with varying degree of accuracy according to different relativized positions. They comprehended subject RCs where relativization occurred on subject position in the RC most accurately, which was followed by direct object RCs. They showed the poorest performance on object of comparison RCs. This finding indicated a close link of relativized positions to RC processing, and was largely in line with what the NPAH Hypothesis predicts with the exception of genitive RCs. In light of Keenan and Comrie’s (1977) view that genitive RCs are uncommon typologically, and are hard to learn, the subjects’ high performance on them was rather surprising, and might be due in part to unique and peculiar nature of a possessive relative pronoun ‘whose’ in form and behavior. Unlike other relative pronouns, ‘whose’ is connected to a noun it modifies, and is placed together with this noun at the beginning of RC. Such a distinctive, syntactic behavior of ‘whose’ would help language users recognize it easily, and be prepared to process the upcoming RC with more readiness. So it may be the case that once the subjects noticed ‘whose’ connected to a noun, they saw it signaling the start of RC, and tried hard to decide where it fitted into inside RC for comprehension. Second, concerning the processing of RCs in various positions of the matrix clause, the subjects comprehended different types of RC constructions with varying degree of accuracy in a specific order in which they had a tendency to comprehend OS and OO types more accurately than SS and SO types. The accuracy order (i.e., OS > OO > SS > SO) seemed to suggest that the Korean subjects’ comprehension of RCs was greatly influenced by cognitive burden caused by center-embedding in the middle of sentence.

On the other hand, as the results of the analysis of production data indicated, throughout
conversation and composition, the subjects showed a strong preference for subject RCs and direct object RCs over object of preposition RCs and genitive RCs while making no attempt to use object of comparison RCs. Such a preference is comparable to the gradual decrease in accuracy during the comprehension of the same types of RCs, which suggests that despite great linguistic differences between L1 and L2, the Korean subjects largely followed the universal, typological order of RC acquisition defined by the NPAH Hypothesis in both context-reduced and context-rich situations.

When considering produced RCs in different positions of the matrix clause, the subjects were found to show limitations in the range of RC types, and relied heavily on OS, SS, OO, and SO types. Further the frequency order of production (i.e., OS > SS > OO > SO) was explained mainly through O’Grady (1999) with the help of Kuno’s (1974) notion of center-embedding in language processing. As for the frequency order of production, some doubts can be raised about whether the frequency order may be the same as the accuracy order. Though production data were analyzed with a focus more on meaning than form, grammatical accuracy was still an important factor in taking frequency counts for all RC constructions during the analysis, which could lead to the assumption that the frequency order is quite close to the accuracy order. Then it would be legitimate and interesting to compare the accuracy order of comprehension (i.e., OS > OO > SS > SO) with the frequency order of production (i.e., OS > SS > OO > SO). Clearly OS type was comprehended most accurately and simultaneously, produced most often while the opposite was true to SO type. It seems that the Korean subjects’ best performance on RC constructions can be obtained when the internal structure of RC construction is simple and straightforward in that it contains no center-embedded RC, and has the shortest distance between a relative pronoun and an extracted noun in RC as in OS type. In addition, one clear difference between the two orderings is that OO type was comprehended more accurately than SS type which in turn was produced more often than OO type. Given the earlier assumption that the overuse of SS type was due mainly to the Korean subjects’ strategy to center on simplicity and transparency of message in the RC which resulted from an artifact of data-gathering method, if data had been collected in a more unobtrusive way, it would have been possible that the frequencies with which SS type was produced during conversation and composition decreased considerably to the point that it was produced less often than OO type. However, there is a danger in placing too much emphasis on the limitation of data collection method since it is unclear at this moment whether the subjects will employ such a speaking strategy in real communicative situations. Also as mentioned before, since SO type requires a more complex psychological process involving a search for a gap-filler in the RC than SS type, the Korean subjects were unlikely to prefer the former over the latter. As a result, a new frequency order, i.e., OS > OO > SS > SO, becomes the same as the accuracy order, which
means that both comprehension and production of RC constructions by the Korean subjects could be handled in much the same way in which they tended to perform better on RC constructions without center-embedded RCs.

Finally, although the subjects showed an exceptionally outstanding performance on genitive RCs in comprehension, they made very few attempts to use them in production. As seen in Table 1 and 2, genitive RCs placed in various positions (e.g., subject, direct & indirect object, and object of preposition) of the matrix clause were processed pretty accurately in elicited imitation task whereas genitive RCs placed in only two positions (i.e., subject and direct object) were produced in conversation and composition. Despite a general superiority of comprehension over production in L2 learning and use (Brown, 2007), a discrepancy between two modes of performance in genitive RCs is noticeable, and indicates that the subjects were much more vulnerable to the production of genitive RCs than the processing of them. This suggests that as mentioned earlier, unique, distinctive features of a possessive relative pronoun might have been helpful mostly for comprehension. For production, the subjects were expected to go through such several steps to create genitive RCs as deciding which noun phrase in the matrix clause would be modified by RC, finding which noun would be combined with a possessive relative pronoun, and tracing where a relative pronoun should fit into in RC. A simultaneous, quick handling of these steps without sufficient planning time during production must have led the subjects to experience much difficulty of using genitive RCs in an active, creative fashion, and to end up with avoiding them. Moreover, in light of the finding that among a total of 607 occurrences of RC constructions produced in both conversation and composition, genitive RCs were generated only 8 times, the subjects showed much more limitations in using them than any other RC type. This demonstrates that they suffered lack of knowledge about realizing the form-function mapping of genitive RCs for communicative purposes to a considerable extent.

VI. CONCLUSION

This study examined EFL Korean learners’ knowledge of RC in both context-reduced and context-rich situations. Their production and comprehension of RCs were shown to be much affected by grammatical positions on which relativization occurs in RC, which is largely in line with Keenan and Comrie’s (1977) NPAH Hypothesis, and is also supportive of many previous works (e.g., Gass, 1978; Izumi, 2003; Pavesi, 1986; Suh, 2003). But the picture seems to be more complicated when it comes to the performance on RCs placed in various positions of matrix clause. The learners comprehended and produced different
types of RC constructions with varying degree of accuracy and frequency, which resulted in both the accuracy order of comprehension and the frequency order of production. Except for some differences between the two sets of ordering which were assumed to be caused by the learners’ strategy to rely heavily on SS type in conversation, the two sets of ordering were the same in that they tended to handle OS type with no center-embedding most accurately and most often while they performed on SO type with center-embedding most poorly and least often, which suggests that center-embedding played the most crucial role in the Korean learners’ performance on RC constructions in terms of accuracy and frequency. This also means that they showed a rather consistent, unified treatment of RC constructions across tasks of production and comprehension in both context-free and context-rich situations. Meanwhile, among many theories and hypotheses about RC acquisition, Keenan and Comrie’s (1977) NPAH Hypothesis and Kuno’s (1974) Perceptual Difficulty Hypothesis appeared to be the two most appropriate tools to explain the overall performance of the Korean learners on RC acquisition. Though both hypotheses are seemingly conflicting and irrelevant to each other, and may lead to a hasty, false impression that what the learners did in the study was quite unpredictable and variable, it should be kept in mind that they can be reconciled easily, and seen as complementary to each other in the sense that the NPAH Hypothesis captures the close link between accurate use of the RC and relativized positions in the RC while the Perceptual Difficulty Hypothesis helps to see how the learners handle RCs placed in various positions of matrix sentence. Such a complementary relationship between the two hypotheses is sure to bring a better way to get a complete picture of comprehension and production abilities of the Korean learners in RC acquisition of L2.

The study has a few limitations. First of all, since data from conversation were gathered as part of assignment in which the learners were required to use as many RCs as they could, they must have felt much pressure to complete it by showing an over-reliance on easy-to-handle RC types like SS type, which was believed to have a negative effect on the overall findings of the study. Next, gender of the subjects was not controlled appropriately. Though it still remains unanswered whether there is any clear relationship between gender and performance on RCs, gender discrepancy is likely to limit generalizability of the findings of the study.

Perhaps one simple reason for learning difficulties in RC acquisition can be found in the very nature of RC that it takes the form of a combined sentence containing two different kinds of information, and needs simultaneous processing of them. Nevertheless, having a good command of RC seems to make considerable contributions to the overall development of L2 proficiency since knowledge of RC constitutes one important aspect of grammatical competence which in turn serves a prerequisite function in the building of communicative competence (Politzer & McGroarty, 1983). This is why L2 learners should
have an appropriate amount of knowledge of basic and daily-use grammatical structures including RC, and be able to use them at their disposal in both context-free and context-rich situations, which eventually will assist them in becoming proficient language users in L2.

REFERENCES


**APPENDIX**

Input sentences to be contained in elicited imitation task

1. Subject-Subject(SubSub type)
   
   The machine that broke down a month ago has been repaired now.

2. Direct object-Direct object(DODO type)
   
   The child ate the sandwich which his mother made for lunch.

3. Indirect object-Indirect object(IOIO type)
   
   The waiter handed a menu to a man whom his friend had given a watch to.

4. Object of preposition-Object of preposition(OPOP type)
   
   A salesman talked to a customer whom he had met with for the first time.

5. Object of comparison-Genitive(OCGen type)
   
   Villagers like swimming more than skiing whose equipment is expensive.

6. Subject-Object of comparison(SubOC type)
   
   The bicycle that the motorcycle is faster than belongs to Mary.

7. Genitive-Indirect object(GenIO type)
   
   The lawyer met with the actress' children whom she gave little attention to.

8. Direct object-Subject(DOSub type)
   
   The doctor examined the sick child who couldn't sleep well last night.

9. Indirect object-Direct object(IODO type)
   
   The city sent food to the villagers whom it had led to a safe place.

10. Object of preposition-Indirect object(OPIO type)
    
    The police met with a little girl whom a boy had given candy to.

11. Object of comparison-Object of preposition(OCOP type)
    
    Movies are more violent than TV programs which people rely on everyday.

12. Subject-Genitive(SubGen type)
    
    The professor whose course I'm taking gives a lot of homework.

13. Direct object-Object of comparison(DOOC type)
    
    They saw the student whom they had a higher score than.
14. Genitive-Object of preposition (GenOP type)
   The chef's recipe which mother had handed down was hit at the restaurant.
15. Indirect object-Subject (IOSub type)
   The college gave scholarships to students who need money to buy books.
16. Object of preposition-Direct object (OPDO type)
   Bob read about a doctor whom many people had thanked for her help.
17. Object of comparison-Indirect object (OCIO type)
   The nation has more interest in its poor people than its rich whom it taxes severely.
18. Subject-Object of preposition (SubOP type)
   The hotel which we stayed at last night was not comfortable and quite.
19. Direct object-Genitive (DOGen type)
   John knows the man on bicycle whose car broke down on the street.
20. Indirect object-Object of comparison (IOOC)
   The boss paid a salary to his workers whom workers in other companies were paid more than.
21. Genitive-Genitive (GenGen type)
   The owner's dog whose body was chilled by the cold waited outside for his master.
22. Genitive-Subject (GenSub type)
   The mayor's son who is known to be intelligent flunked in his math course.
23. Subject-Indirect object (SubIO type)
   Students whom the school gave scholarships to wanted to become scientists.
24. Object of comparison-Direct object (OCDO type)
   John is easier to live with as a roommate than Tom whom people see as noisy.
25. Object of preposition-Subject (OPSub type)
   Yesterday I ran into an old friend who had been studying abroad for years.
26. Direct object-Object of preposition (DOOP type)
   A mother kept the cheese that her son had been looking for.
27. Indirect object-Genitive (IOGen type)
   A boss gave a prize to employees whose work was great.
28. Object of preposition-Object of comparison (OPOC type)
   People complained about their building which other buildings are less dirty than.
29. Genitive-Object of comparison (GenOC type)
   The car's engine which other manufacturers' cars were smaller than is still inefficient.
30. Subject-Direct object(SubDO type)
The pilot's carry-on which passengers saw was filled with only documents.

31. Object of comparison-Subject(OCSub type)
New cars are more efficient in fuel consumption than old cars which are slow and noisy.

32. Subject-Direct object(SubDO type)
The dress which Ann bought at a department store doesn't fit her very well.

33. Direct object-Indirect object(DOIO type)
Students saw a teacher at a theater whom they wanted to send a letter to.

34. Indirect object-Object of preposition (IOOP type)
A boy in a kindergarten gave a gift to a girl whom he had been waiting for.

35. Object of preposition-Genitive (OPGen type)
A man at a train station apologized to the lady whose coffee he spilled.

36. Object of comparison-Object of comparison (OCOC type)
An old painting is more expensive than an old car which people see the old painting as being more valuable than.

cf) Subject: Sub, Direct object: DO, Indirect object: IO, Object of preposition: OP, Genitive: Gen, Object of comparison: OC

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Jaesuk Suh
Dept. of English Education
Inha University
Younghyun-dong Nam-gu, Incheon
Tel: (032) 860 - 7854
Fax: (032) 865 - 3857
E-mail: jssuh@inha.ac.kr

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