

A Corpus Study of L2 Korean Relative Clause Development

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The current study examines whether L2 development patterns of Korean relative clauses (RCs) are in accordance with the natural acquisition order observed in L1 children and the RC acquisition order predicted by the Noun Phrase Accessibility Hierarchy (NPAH, Keenan & Comrie, 1977). The study used CHILDES to analyze a learner corpus containing task-based interactions between 38 adult KSL/KFL learners and a native speaker interlocutor. A total of 1,731 oral productions of Korean RCs were identified in the corpus. The findings suggest that, unlike L1 children acquiring Korean in natural settings, adult L2 learners produce head-external RCs from the beginning rather than going through headless or head-internal RC stages, which is in line with the instructional order for Korean RCs in L2 classrooms. In addition, among the head-external RCs, the learners produced subject RCs more frequently and accurately than direct object RCs, and direct object RCs more frequently than oblique RCs, confirming the NPAH.

Keywords: Korean relative clauses, acquisition of Korean relative clauses, Korean language development, corpus, Noun Phrase Accessibility Hierarchy

1. Introduction

As a syntactic structure, the relative clause (RC) has received a considerable amount of attention in both language acquisition and language processing research, due to its structural complexity and processing difficulty. Various theoretical accounts (Keenan & Comrie, 1977; MacWhinney, 1982; O'Grady, 1997, 2011; Sheldon, 1974; Slobin, 1973, Slobin & Bever, 1982; Tavakolian, 1981) have been proposed for RC processing difficulties and strategies, and a body of research has tested

these accounts. In particular, much attention has been paid to the Noun Phrase Accessibility Hierarchy (NPAH), which was proposed by Keenan and Comrie (1977); quite a large number of studies (Croteau, 1995; Doughty, 1991; Eckman, Bell, & Nelson, 1998; Gass, 1979; Hawkins, 1989; Hyltenstam, 1984; Izumi, 2003; Kanno, 2007; Ozeki & Shirai, 2007) have been carried out to confirm the NPAH in L2 acquisition as well, although they have mainly been confined to European languages.

A number of studies have been conducted on the acquisition of Korean RCs by L1 children (S Cho, 1999, 2003; Clancy, H Lee, & M-H Zoh, 1986; Y-J Kim, 1987; K-O Lee, 1991). Based on the findings of these studies, a developmental sequence has been established for Korean RC acquisition, although it is not yet clear whether such an order is observed in L2 acquisition as well. Therefore, the current study examines oral productions of Korean RCs by adult L2 learners in order to: (a) compare the L2 development order of Korean RCs to the L1 development order displayed by children acquiring the language in natural settings to see whether adult L2 learners of Korean acquire Korean RCs in a similar way to L1 children, and also (b) to examine whether L2 learners of Korean acquire the Korean RCs following the order predicted by the NPAH, as has been evidenced in the L2 acquisition of European languages.

2. Literature Review

2.1. Characteristics of Korean RCs

Korean RCs are distinguished from the RCs of European languages in various aspects (S Cho, 1999; A Kim, 1990; T Kim, 1990; H-M Sohn, 1994, 1999). First of all, they are prenominal, and their construction involves no relative pronoun or syntactic movement. Instead, the RC boundary is marked by an adnominal suffix (or relativizer) such as *-un*, *-nun*, or *-ul*. Another crucial difference between Korean and European RCs is that Korean allows both head-external and head-internal RCs depending on the location of the head noun in relation to the RC. Head-external RCs are similar to European RCs in that the head noun is placed outside

the RC and an empty slot (i.e., gap) is created in the original place of the head noun inside the RC, as shown in example (1). In contrast, head-internal RCs contain the head noun inside the modifying RC, and no gap is postulated, as displayed in example (2). Furthermore, head-internal RCs are followed by the complementizer *-kes*, which is employed to mark the RC's boundary.

(1) Head-external RC:

[____ *sakwa-lul mek-un*] *ai*
 apple.ACC eat.REL child
 'the child who ate the apple.'

(2) Head-internal RC:

John-i [*khemphyuthe-ka kocangna-n*] *kes-ul* *kochi-ess-ta.*
 John.NOM computer.NOM out of order.REL COMP.ACC repair.PAST-DEC
 'John repaired the computer that was out of order.'

(From S Cho & O'Grady, 2011, p. 168)

Head-external and head-internal RCs also exhibit critical differences with regard to the positions that can be relativized. Whereas only subject and direct object positions can be relativized in head-internal RCs, head-external RCs permit relativization of subject, direct object, indirect object, and oblique. All of these unique characteristics of Korean RCs can become sources of difficulty for L2 learners acquiring the Korean language, especially for those learners whose first languages are typologically different from Korean.

2.2. Acquisition of Korean RCs by L1 Children

Two naturalistic studies that analyzed children's spontaneous speech data both longitudinally and cross-sectionally (Y-J Kim, 1987; K-O Lee, 1991) have reported similar patterns of Korean RC development. S Cho and O'Grady (2011) later summarized these patterns into four stages: (a) RCs with a zero head, (b) head-internal RCs, (c) head-external RCs

with *-ke(s)* and a lexical head, and (d) head-external RCs with a lexical head. An example of each stage is presented below:

(3) RCs with a zero head

[*cacenke tha-nun*]
 bicycle ride_{REL}
 ‘(the doll) riding a bicycle.’

(4) Head-internal RCs

[*Piano tangtang ha-nun*] *ke sa cwuya keyssta.*
 piano dingdong do_{REL} COMP buy give
 ‘(I) have to buy for (her) the one that (you) do ding-dong piano.’

(5) Head-external RCs with *-ke(s)* + a lexical head

[*kuriko appa ssu-nun*] *ke ankyeng-un*
 and dad wear_{REL} COMP glasses_{TOP}
 ‘and the glasses that Daddy wears...’

(6) Head-external RCs with a lexical head

[*appaka yo ankyeng sacwu-l*] *ton-i epstakoyo...*
 dad_{NOM} glasses buy_{REL} money_{NOM} not have because
 ‘There isn’t money for Daddy to buy me the glasses’

(From S Cho & O’Grady, 2011, p. 169)

The first RC construction L1 children produced was RCs with a zero head. In this stage, children attempted to produce RCs by either merely juxtaposing two sentences without a relativizer or employing a relativizer but still omitting the lexical head, as shown in example (3). In the following stage, they started to employ the complementizer *-kes* on the right side of the modifying RC, creating a head-internal RC. In this stage, however, they often omitted the lexical head inside the head-internal RCs, resulting in the production of free relative clauses. In the third stage, they started

to utter head-external RCs by creating a gap inside the RCs. Nevertheless, the RC structure they produced was still incomplete; they placed the complementizer *-kes* between the modifying head-external RC and the lexical head, as shown in (5). This stage can be considered as a transitional period between head-internal and head-external RCs.¹⁾ After going through this period, children finally started to produce complete head-external RCs by correctly placing the lexical head immediately after the modifying RC and not employing the complementizer *-kes*, as shown in (6).

The same RC development pattern was confirmed in experimental studies as well. According to S Cho (1999, 2003), younger children (at the age of 4 to 5) produced head-internal RCs more frequently than head-external RCs. However, as they reached the age of 6 or 7, the production of head-external RCs became more predominant. Moreover, when comprehension was examined, children in all age groups comprehended head-internal RCs more accurately than head-external RCs, all of which indicate that head-internal RCs are acquired earlier than head-external RCs by L1 children. With regard to the various gap positions of head-internal and head-external RCs, the study also showed that children produced direct object RCs more frequently than subject RCs in the case of head-internal RCs, but produced subject RCs more frequently than direct object RCs in head-external RCs (Cho, 1999).

2.3. Acquisition of Korean RCs by L2 Adult Learners

A large body of research (Croteau, 1995; Doughty, 1999; Eckman, Bell, & Nelson, 1988; Gass, 1979; Hawkins, 1989; Hyltenstam, 1984; Izumi, 2003; Kanno, 2007; Ozeki & Shirai, 2007) has been carried out on L2 acquisition of head-external RCs across various languages, with the purpose of confirming whether the acquisition order predicted by the NPAH is observed in L2 acquisition of RCs as well.²⁾ According to the NPAH,

1) It is probable that L1 children produced this transitional structure because postulating a gap inside an RC increases processing difficulty. It has been shown in language acquisition studies that structures with an empty slot inside a clause tend to be acquired at a later stage of language development (Cho, 2003).

languages permit RCs in the following order: subject > direct object > indirect object > oblique > genitive > object of comparison. For example, if a language allows the genitive position to be relativized, then all the other positions higher in the hierarchy (i.e., subject, direct object, indirect object, and oblique) should be able to be relativized. The NPAH also predicts that RC acquisition difficulty should be in line with the hierarchy, and thus L2 learners would acquire the various gap positions of head-external RCs following the hierarchical order. Studies conducted on the acquisition of European RCs (including English, French, Italian, and Swedish) have reported findings that were congruent with the NPAH, while studies conducted on Japanese RCs (Kanno, 2007; Ozeki & Shirai, 2007) have obtained conflicting findings. A few studies (S Huh, 2011; C Kim, 2010; 2011, 2013; S Lee-Ellis, 2011; O'Grady, M Lee, & M Choo, 2003; O'Grady, Yamashita, M Lee, M Choo, & S Cho, 2000) also have been carried out on L2 acquisition of Korean RCs, employing different types of tasks. The findings were generally in support of the NPAH, confirming that Korean L2 learners acquire the Korean head-external RCs in the order of: subject > direct object > oblique RCs (S Huh, 2001; K S Jeon & H-Y Kim, 2007; O'Grady et al., 2000, 2003).

Unlike the studies that were mainly concerned with the acquisition of head-external RCs, Jeon and Kim (2007) examined the overall developmental pattern of Korean RCs in their analysis of RC production data elicited from adult L2 learners. Based on the findings, they suggested the following sequence of Korean RC development: headless RCs > headless RCs + *-kes* > head-internal RCs + \emptyset > head-internal RCs + *-kes* > head-external RCs + *-kes* > head-external RCs + resumptive noun > head-external RCs. To put this another way, the adult L2 learners of Korean who participated in their study produced Korean RCs in an order that is similar to the natural acquisition order observed in L1 children (i.e., headless > head-internal > head-external RCs). Although Jeon and Kim's study contributed to building a more holistic picture of the L2

2) It should be noted that head-internal RCs are unique to Korean and Japanese; therefore, studies conducted on RCs in other languages are mainly focused on the acquisition of head-external RCs.

development of Korean RCs than previous studies had provided, it should be noted that all of their participants were American college students with English L1 backgrounds, and the majority of them were heritage learners who had prior exposure to naturally spoken Korean language in their households or communities prior to the formal language instruction they received in college. Thus, the study does not provide information regarding whether adult learners of Korean who come from various L1 backgrounds and who are learning Korean in various settings would acquire the Korean RCs in the same order observed in L1 children.

Hence, the current study aims to obtain a more comprehensive and holistic picture of the overall L2 developmental pattern of Korean RCs by analyzing oral production data elicited from learners with diverse L1 backgrounds in both KFL and KSL settings. The following research questions were developed accordingly:

1. Is the L2 development order of Korean RCs consistent with the natural acquisition order observed in L1 children (i.e., headless > head-internal > head-external)?
2. Do adult L2 learners of Korean acquire the various gap positions of head-external RCs in the order that is in accordance with the predictions of the NPAH (i.e., subject > direct object > oblique)?

3. Methods

3.1. Learner Corpus

In the current study, a learner corpus containing 152 dyadic, oral, task-based interactions between a native speaker interlocutor and L2 learners of Korean ($n = 38$) was analyzed. The learners were studying Korean in three different university-level Korean language programs located in Seoul (i.e., two KSL programs) and Honolulu, Hawai'i (i.e., one KFL program). Considering that the RC structure is introduced from the high-beginning level in all three institutions, the participants were recruited from high-beginning to intermediate level classes. Out of the total of 38

learners, 25 were KFL learners (65.8%), and 13 were KSL learners (34.2%). The learners had various L1 backgrounds including English, Chinese, Japanese, and Cantonese, and fifteen of them were heritage learners of Korean (39.5%).

The task-based interactions were originally carried out as treatment tasks for a larger experimental study (S Huh, 2013); only the interaction treatment data were included in the corpus and analyzed in this study. During the interaction treatments, each learner performed two information gap tasks (i.e., a one-way task and a two-way task) individually with the native speaker on two different occasions. The two tasks were developed by adapting the ones used by K S Jeon (2004): a *Find the Circles Task* (FCT) and a *Draw the Circles Task* (DCT). The learners and the native speaker interlocutor were given a picture with circles drawn on different targets (in the case of the FCT) or only in the learners' picture (in the case of the DCT), and they were asked to ask questions to find out where the circles were drawn on their partner's picture. The total of 40 RC targets that were included in the tasks comprised 12 subject, 24 direct object, and 4 oblique RC targets. The greater number of direct object RC targets is due to the fact that the larger interaction study that produced these data focused on the acquisition of direct object RCs. For the same reason, the learners received interactional feedback in the form of recasts following erroneous productions of direct object RCs during the interaction.

3.2. Data Analysis

The learner corpus was analyzed using CHILDES (Child Language Data Exchange System, MacWhinney, 2000). CHILDES was originally created as a language database to analyze child language speech samples across different languages. It has been expanded to a much larger set of corpora (i.e., TalkBank), which now includes not only first language data but also second language acquisition, conversation analysis, and classroom discourse corpora. In CHILDES, the CHAT format is used for transcription and the CLAN program for data analysis. Hence, in this

study, all the interactions between a learner and the native speaker interlocutor were transcribed using the CHAT format, and the CLAN program was used to code and tally all the occurrences of the RCs identified.

3.3. Coding Categories

Based on the patterns of RC constructions that emerged from the data, nine coding categories were developed in this study, adapting the natural RC acquisition order manifested by L1 children as well as the coding categories employed in K S Jeon and H-Y Kim’s (2007) study. Table 1 presents each coding category with an example.

Table 1. RC Coding Categories

Coding Category	Example
Juxtaposition	[<i>namca-ka sinmwun ilk-e]-ey iss-eyo.</i> man _{NOM} newspaper read at be-DEC '(The circle) is on the man reads newspaper.' (for '(The circle) is on the newspaper the man reads.')
Headless RCs	[<i>penchi-ey anc-un</i>] bench-at sit-REL '_____ that sits on the bench.'
Head-internal RCs + \emptyset	[<i>namca-i aisu khulim mek-un</i>] men _{NOM} ice cream eat-REL '_____ that the man ate the ice cream'
Head-internal RCs	[<i>ku haympeke meku-nun</i>] <i>ke</i> the hamburger eat-REL COMP 'the thing that (the man) eats the hamburger'
Head-internal RCs + a lexical head	[<i>namca chayk ilk-un</i>] <i>kes chayk</i> the man book read-REL COMP book 'the book, the thing that the man reads'
Head-external RCs with no relativizer	[<i>namca wuncen</i>] <i>catongcha</i> man driving car 'the car which the man drives'
Head-external RCs with a resumptive noun	[<i>namca kay an-ko iss-nun</i>] <i>kay</i> man dog hold-PROG-REL dog 'the dog which the man is holding the dog'

Coding Category	Example
Head-external RCs with other structural error(s)	[<i>po-ko iss-nun namwu</i>] <i>ai</i> <small>see-PROG.REL</small> tree child ‘the boy who at the tree is looking’ (for ‘the boy who is looking at the tree’)
Head-external RCs	[<i>namca po-nun</i>] <i>sinmwun</i> man <small>see.REL</small> newspaper ‘the newspaper which the man reads’

Unlike S Cho and O’Grady’s classification (2011), in the current study, mere juxtapositions were distinguished from RCs with a zero head. Thus, when the learners simply put two sentences together without employing any relativizer, it was coded as *juxtaposition*, and only when the learners successfully attached a relativizer but failed to produce a head noun was it coded as a *headless RC*. Head-internal RCs were classified into two categories, depending on the presence of the complementizer *-kes* following the RC: *head-internal RC + ∅* and *head-internal RC*. Only a head-external RC successfully incorporating *-kes* was coded as a head-internal RC, and all other head-internal RCs (i.e., that were not followed by *-kes*) were coded as a head-internal RC + ∅. A head-internal RC successfully incorporating *-kes*, but with the lexical head on the right side of the RC, was coded as a *head-internal RC + a lexical head*.

Head-external RCs were classified into four different categories according to the completeness of the RC structure and the types of errors involved in the RCs (in the case of the erroneous RCs). Three categories were developed for the erroneous head-external RCs that suffered from major structural errors: (a) *head-external RC with no relativizer*, (b) *head-external RC with a resumptive noun*, and (c) *head-external RC with other structural error(s)*. When a head-external RC was produced, but the relativizer was omitted at the end of the RC or a resumptive noun remained inside the RC, it was coded as a head-external RC with no relativizer or a head-external RC with a resumptive noun, respectively. Besides these errors, the learners sometimes produced head-external RCs with the arguments inside the RC in the wrong order, as shown in Table 1. Such an error often interfered with the correct interpretation of the meaning of the RC, and

for this reason these poorly structured head-external RCs were coded as head-external RCs with other structural error(s). Only head-external RCs that were produced accurately without containing these major structural errors were categorized as head-external RCs.

All of the RCs identified in the corpus were once again classified into three categories based on the grammatical function of the head noun: (a) subject RC, (b) direct object RC, and (c) oblique RC.³⁾ Next, all the well-structured head-external RCs (i.e., the head-external RC category) were also checked for any minor RC related error(s) contained in the RC, such as case marker errors, tense/inflection errors, or argument omission errors, and the RCs containing these errors were separated from correct head-external RCs. An example of each error category is presented in Table 2. It should be noted that only the errors that were pertinent to RC construction were checked for in this study, and all other errors that were irrelevant to RC construction were disregarded.

Table 2. Error Categories

Error Category	Example
Tense/Inflection errors	[<i>ku kkoch patu-nun yeca</i>]- <i>ey tongkulami iss-eyo.</i> the flower receive _{REL} woman at circle be _{DEC} 'The circle is on the woman who receives the flowers.' (<i>patu-nun</i> > <i>pat-nun</i>)
Case marker errors	[<i>yeca yeca-nun ilk-un</i>] <i>chaek-un tongkulami iss-eyo.</i> woman woman _{TOP} read _{REL} book _{TOP} circle be _{DEC} 'The circle is on the book the woman read.' (<i>yeca-nun</i> > <i>yeca-ka</i>)
Argument omission errors	[<i>ilk-nun yeca</i>]- <i>ey tongkulami iss-eyo.</i> read _{REL} woman at circle be _{DEC} 'The circle is on the woman who reads.' (when there are two women in the picture who were reading)

3) In the current study, indirect object RCs (e.g., [*namca-ka kkoch-ul cw-un*] *yeca* 'the woman whom the man gave flowers') were included in oblique RCs, following Ozeki and Shirai's (2007) classification.

4. Results

A total of 1,731 RC constructions were identified in the corpus (on average 45.5 RCs per learner).⁴⁾ Among them, there were 976 subject RCs (56.4%), 705 direct object RCs (40.7%), and 50 oblique RCs (2.9%). Table 3 presents the frequency of RCs for each coding category.

Table 3. Frequency of Each RC Coding Category

Coding Category	SU	DO	OBL	Total (%)
Juxtaposition	5	0	0	5 (0.3%)
Headless RCs	4	5	0	9 (0.5%)
HI RCs + \emptyset	4	7	1	12 (0.7%)
HI RCs	1	6	0	7 (0.4%)
HI RCs + a lexical head	0	1	0	1 (0.1%)
HE RCs with no relativizer	9	24	0	33 (1.9%)
HE RCs with a resumptive noun	3	27	0	30 (1.7%)
HE RCs with other structural error(s)	7	5	0	12 (0.7%)
HE RCs	943	630	49	1,622 (93.7%)
Total	976	705	50	1,731 (100.0%)

* HI RCs: head-internal RCs; HE RCs: head-external RCs

** SU: subject RCs; DO: direct object RCs; OBL: oblique RCs

As shown in the table, the majority of the RCs identified in the learner corpus were head-external RCs; approximately 98.0% of the total RCs (1,697 RCs) were head-external RCs (including both with and without major structural errors), and only the remaining 2.0% (34 RCs) belonged to the other stages of the development of RC construction, such as juxtaposition, headless RCs, head-internal RCs + \emptyset , head-internal RCs, and head-internal RCs + a lexical head. More specifically, juxtapositions were produced five times, mostly by a single KFL learner who could barely construct head-external RCs during the interaction. In the next coding category, headless RCs were produced nine times in total by seven learners.

4) It should be noted that the frequency of RCs is much higher in this study than in natural conversation, as the tasks employed in this study were designed to be conducive to the elicitation of RCs.

Head-internal RCs were identified 20 times in the corpus (1.2%). Among them, twelve RCs (60%) were incomplete head-internal RCs, which did not incorporate the complementizer *-kes* (i.e., head-internal RCs + \emptyset). Only seven RCs (35%) were complete head-internal RCs that were followed by *-kes* (i.e., head-internal RCs), and there was one incidence of a head-internal RC with a lexical head noun (5%).

Head-external RCs, which represent the final stage of RC development, were produced 1,697 times in total. Among these, 1,622 RCs (95.5%) were well-structured head-external RCs (i.e., the head-external RC category), and the rest (75 RCs, 4.4%) contained major structural errors. To be more specific, 33 RCs (44.0%) were produced without an adnominal suffix attached to the predicate (i.e., head-external RC with no relativizer), and 30 RCs (40.0%) contained a resumptive noun that remained inside the RC (i.e., head-external RC with a resumptive noun). Twelve RCs (16.0%) involved other types of structural errors, most of which involved placing the arguments inside the RC in the wrong order (i.e., head-external RC with other structural error(s)).

The head-external RC category was further checked for minor RC related errors, as mentioned earlier, and these erroneous RCs with, for example, case marker errors, tense/inflection errors, and argument omission errors were distinguished from the correct head-external RCs. Table 4 presents the frequency and accuracy of both correct and erroneous head-external RCs. Among the total of 1,622 head-external RCs, 63.4% of them were produced correctly (1,031 RCs). The rest were erroneous RCs (591 RCs, 36.4%), and 664 errors in total were identified in the RCs in this category. When the frequency of each error type was examined, tense/inflection errors were the most frequent (438 RCs, 66.0%), followed by argument omission errors (128 RCs, 19.3%). Case marker errors and other types of errors accounted for only 6.3% (42 RCs) and 8.4% of the total errors (56 RCs), respectively. It should be noted that more than 10% of the erroneous RCs (72 RCs) contained more than one error type (i.e., multiple errors).

Table 4. Frequency and Accuracy of Head-external RCs

	SU	DO	OBL	Total
Correct	691 (73.3%)	312 (49.5%)	28 (57.1%)	1,031 (63.6%)
Erroneous	252 (26.7%)	318 (50.5%)	21 (42.9%)	591 (36.4%)
Total	943 (58.1%)	630 (38.8%)	49 (3.0%)	1,622 (100%)

When the various gap positions of head-external RCs were examined, subject gap RCs were produced with the greatest frequency (943 RCs, 58.1%), followed by direct object RCs (630 RCs, 38.8%) and oblique RCs (49 RCs, 3.0%). When we consider the uneven numbers of the targets included in the tasks for each gap position (12 subject, 24 direct object, and 4 oblique RC targets), the frequency differences among the three RC types become even more striking. On average, 24.8 subject RCs were produced by each learner, which is more than two times the total number of the subject RC targets included (206.8%). On the other hand, only 16.6 direct object RCs were produced on average, comprising 69.1% of the total direct object RC targets, and oblique RCs were produced 1.29 times per learner, which is equivalent to 32.2% of the total oblique RC targets incorporated. In other words, the learners preferred to produce subject RCs over direct object and oblique RCs, and they produced subject RCs even when they were asked about direct object or oblique RC targets. The frequency differences among the three RC types were also shown to be statistically significant, according to a one-way repeated measures ANOVA ($F(2, 36) = 192.768, p = .000, \eta_p^2 = .915$).

With regard to the accuracy of each gap position, as shown in Table 4, the accuracy rate was the highest for subject RCs (73.3%), followed by oblique RCs (57.1%) and direct object RCs (49.5%). A one-way repeated measures ANOVA also confirmed that the differences among the three different gap positions were statistically significant in terms of accuracy ($F(2, 36) = 26.892, p = .000, \eta_p^2 = .599$). Put another way, subject RCs were more accurately produced than direct object and oblique RCs, and oblique RCs were again more accurately produced than direct object RCs. Nevertheless, due to the small number of oblique RCs in the data ($k = 49, M = 1.29$), we cannot conclude that the participants' mastery

of oblique RCs was more complete than their mastery of direct object RCs. Not only was the number of oblique RCs produced very small, but more than a quarter of the learners ($n = 10$, 26.3%) did not produce even a single oblique RC during the interaction, despite the oblique RC targets included in the task.

5. Discussion

The first research question addressed whether the L2 developmental pattern of Korean RCs is in accordance with the natural acquisition order manifested in L1 acquisition studies. More specifically, it concerned whether adult L2 learners of Korean would acquire the Korean RCs following the same order observed for L1 children: from headless RCs to head-internal RCs and to head-external RCs. In order to compare L1 and L2 acquisition patterns, nine coding categories were developed in this study; the frequency of RCs for each category was presented in Table 3. The findings suggested that unlike L1 children acquiring Korean RCs in natural environments, most of the adult KSL/KFL learners examined in this study produced head-external RCs from the beginning of their Korean RC acquisition, rather than going through the headless or head-internal RC stages. About 98% of the total RCs produced were head-external RCs, and only the remaining 2% belonged to the earlier stages of RC development (e.g., juxtaposition, headless RCs, and head-internal RCs). In other words, the adult learners who participated in this study rarely attempted to produce an RC by merely juxtaposing two sentences without incorporating a relativizer, or to create an RC that contained no lexical head, as L1 children often do at the initial stages of RC development. In addition, the occurrences of head-internal RCs were remarkably low in the current study compared to what other studies have reported for L1 children.

Previous L1 acquisition studies have shown not only that L1 children acquire head-internal RCs prior to head-external RCs, but that they also rely heavily on head-internal RCs until they became capable of producing

head-external RCs. For instance, in K-O Lee's study (1991), more than 75% of the total RCs produced by children were head-internal RCs, and approximately a third of the children produced only head-internal RCs without uttering a single head-external RC, whereas no child produced head-external RCs exclusively. Furthermore, when the children produced head-internal RCs, they were mostly accurate about the deployment of the complementizer *-kes* (K-O Lee, 1991). However, no such tendencies were observed in the L2 adult learners investigated in the current study. Not only was the overall frequency of head-internal RCs very low, but only a small number of the learners ($n = 9$, 23.7%) produced head-internal RCs (including both with and without *-kes*). In addition, out of the total of 19 head-internal RCs elicited, only seven were complete head-internal RCs containing *-kes*.

A close examination of the individual learners' developmental profiles also revealed that although the forms associated with earlier stages of Korean RC development were produced by some learners in this study, none of these learners used the forms of a given stage exclusively, as is the case for L1 children. Rather, it seemed that these earlier-stage RC constructions occurred accidentally and occasionally as the learners attempted to construct head-external RCs. All the learners who produced these earlier-stage RC forms also produced head-external RCs in much greater proportion, and some learners deployed RC constructions of various stages in their utterances. For instance, a single non-heritage KFL learner produced juxtaposition, head-internal RCs without *-kes*, and successful head-external RCs. Therefore, it can be concluded that most of the adult KSL/KFL learners examined in this study did not have to resort to head-internal RCs prior to their acquisition of head-external RCs, as L1 children did. Rather, they seem to start to acquire head-external RCs from the outset, although they created some earlier-stage RC constructions as by-products as they were trying to construct head-external RCs.

The differences between L1 children and L2 adult learners with regard to their acquisition of Korean RCs can be attributed to various factors affecting the adults' learning, such as cognitive maturity, L1 transfer, the frequency of the input, and lastly, instruction effects. First of all, as adults,

the KSL/KFL learners examined in this study were more cognitively mature than L1 children, which enabled them to more capably handle the complexity of creating the head-external RCs by postulating a gap inside the RCs. In addition, the knowledge of the head-external RC structure was readily available from their L1 to transfer, as they were native speakers of English, Japanese, Chinese, and Cantonese; all of these languages employ head-external RCs, and some of them only permit head-external RCs (i.e., English, Chinese, and Cantonese). Thus, unlike L1 children who have to learn how to postulate an empty slot inside the RC in the first place while moving the head noun to the right side of the RCs, these adult learners were already familiar with such a process and thus could benefit from it, although the position of the head noun and the utilization of relativizers were somewhat different. Thirdly, the disproportionate frequency of head-internal and head-external RCs in natural language environments might affect the acquisition process of these RCs. Although both types of RC structures exist in Korean, the use of head-internal RCs is much less frequent and more restricted than the use of head-external RCs (S Cho, 2014). Therefore, it is possible that the L2 learners, especially in the case of the KSL learners and the heritage learners in the KFL setting, had been exposed to head-external RCs to a much greater extent than head-internal RCs in real-life contexts, which would promote their acquisition of head-external RCs. Lastly, but most importantly, the classroom instruction the learners had received on Korean RCs may have contributed to their early acquisition of head-external RCs. A close examination of the textbooks used in the learners' KSL/KFL classes revealed that whereas head-external RCs were presented from the end of the beginning level, head-internal RCs were not introduced until the advanced level, if they were ever taught. Thus, it is possible that many of the learners had only acquired explicit knowledge of the head-external RC structure through classroom instruction, which was therefore the structure they started to produce first. All of these factors seem to have worked together to contribute to the adult learners' acquisition of head-external RCs first, in contrast to the Korean L1 children's developmental pattern.

In spite of the clear preference for head-external RCs shown by these high-beginning and intermediate level adult learners, many of the participants also demonstrated difficulty in constructing them, which can be attributed to the structural complexity and high processing loads imposed by head-external RCs. Such processing difficulties were evidenced in slowed speech rates as well as frequent self-corrections made while formulating head-external RCs. In addition, they made various structural errors, as discussed earlier, including missing a relativizer, leaving a resumptive noun inside the RC, and placing the arguments inside the RC in the wrong order, which seriously affected the grammaticality of the RCs.

In addition, slight but interesting differences emerged between heritage and non-heritage learners' data. The overall RC developmental pattern of the heritage learners seemed to more closely resemble that of L1 children than did the non-heritage learners' patterns. First of all, heritage learners produced a greater number of earlier-stage RC constructions ($M = 1.32$) than non-heritage learners ($M = .68$). Second, most of the head-internal RCs that contained *-kes* were produced by heritage learners. Third, heritage learners experienced greater difficulties with creating a gap inside the head-external RCs, which resulted in their committing more resumptive noun errors ($M = 1.08$) than non-heritage learners ($M = .64$). On the other hand, non-heritage learners made more errors of omitting a relativizer at the end of an RC; more than 85% of these errors were made by non-heritage learners. The attachment of an adnominal suffix to the predicate of an RC is a unique feature of the Korean RC construction which is not shared by other languages, even Japanese, and it seems to be one of the primary sources of the challenges for non-heritage learners, whose L1s do not require such morphological changes to construct an RC.

The second research question concerned whether adult L2 learners of Korean would acquire the various gap positions of head-external RCs in accordance with the acquisition order predicted by the NPAH (i.e., subject > direct object > oblique RCs). In order to answer this question, all the head-external RCs identified in the current study were further examined for their gap positions, and the frequency and accuracy of each gap position were reported in Table 4. In general, the findings were in support

of the prediction of the NPAH. To begin with, subject RCs were produced more frequently than direct object RCs, and direct object RCs were produced with greater frequency than oblique RCs. The frequency differences among the three RC types were statistically significant. The differences became even more remarkable when viewed in light of the unequal numbers of different RC targets included in this study, as mentioned earlier; more than two times as many subject RCs were produced than were included as targets, whereas the direct object RCs produced were about two-thirds as many as were included as targets, and the oblique RCs produced were about one-third as many as were included as targets. The accuracy data also confirmed that the learners produced subject RCs (73.3%) more accurately than direct object (49.6%) or oblique RCs (58.3%), although it was not quite clear from the findings whether oblique RCs were also more accurately acquired than direct object RCs, due to the small number of oblique RCs elicited and the limited number of learners who produced oblique RCs. It is possible that only the learners who were capable of and felt comfortable with creating oblique RCs produced them, while the others avoided doing so.

The evidence seems to suggest that subject RCs are indeed easier to acquire than direct object RCs and also that direct object RCs are easier than oblique RCs, at least for the adult L2 learners examined in this study. The learners seemed to prefer to produce the RCs that were higher on the hierarchy than those that were lower, due, it can be assumed, to relative ease of processing. In particular, they preferred to produce subject RCs instead of direct object RCs or object RCs. In addition, the learners were more accurate in their use of RCs that are higher on the hierarchy, at least in case of the subject RCs.

6. Conclusion & Implications

In summary, the adult L2 learners of Korean who were involved in this study seemed to produce head-external RCs from the outset of their Korean RC acquisition process, rather than following the natural acquis-

ition order manifested by L1 children (i.e. headless > head-internal > head-external). Such a developmental pattern is in line with the instructional order of the Korean RCs in both KSL and KFL classrooms, and with the relative frequency of head-internal and head-external RCs in natural language environments. In addition, adult learners are presumed to be more developmentally ready to acquire head-external RCs due to their cognitive maturity and possible L1 transfer. All of these factors seem to have contributed to their acquisition of head-external RCs; although their proficiency was fairly low, most of the learners in this study were able to construct head-external RCs, apparently without having passed through the various stages of RC development as L1 children do. With respect to the acquisition of the various gap positions in the head-external RCs, the adult learners exhibited a similar pattern of development as L1 children, generally supporting the prediction of the NPAH. More specifically, subject RCs were produced more frequently and accurately than direct object RCs, and direct object RCs more frequently than oblique RCs.

The current study provides invaluable insights into the L2 developmental process of Korean RCs. In particular, by focusing on the overall developmental pattern of Korean RCs rather than only focusing on head-external RCs, the current study revealed that adult learners of Korean exhibit a somewhat different profile of RC development from the L1 children who acquire the language in a natural setting. It is to be hoped that the findings of the current study can help Korean language educators better understand learners' overall developmental process as well as learning difficulties, and thus enable them to provide more adequate instruction on Korean RCs. For instance, the current study has shown that tense/inflection errors were those most frequently committed by the adult L2 learners when constructing RCs. In addition, many of the learners seemed to be unaware of the fact that a topic marker is not allowed inside an RC. Because this inaccurate particle use would not interfere with meaning, learners might continue to produce such ungrammatical RCs without acquiring the knowledge that would lead them to produce grammatical RCs. Korean language educators should be encouraged to highlight these aspects when they provide instruction on Korean RCs to raise learners' awareness.

In addition, as it was shown in this study that L2 learners experience greater difficulty with direct object and oblique RCs than subject RCs, it would be advisable to introduce the various gap positions in sequence or spend more time on practicing direct object and oblique RCs when presenting head-external RCs.

Although the current study provided a more comprehensive picture of the overall L2 developmental pattern of Korean RCs, it also suffers from several limitations. First of all, the learner corpus used in this study contained task-based interaction data rather than naturally occurring data, and the tasks were designed to promote RC production, as the data were originally collected as part of a larger interaction study. Therefore, it would be desirable for future studies to analyze RC production in free speech samples obtained from natural conversational settings. In addition, L2 learners' production of Korean RCs was only cross-sectionally examined in the current study. Although this manner of proceeding was useful to capture a more comprehensive and holistic view of the L2 development of Korean RCs by including learners from various language backgrounds and instructional settings, in future studies, collecting L2 production data longitudinally might allow us to gain a much deeper understanding of the L2 Korean RC development process.

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