

Relative Clauses and Subject-drop in KSL Learners' Writing: Sentence Processing Approach*

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This paper investigates acquisition of Korean relative clauses by KSL (Korean as a Second language) learners, testing Keenan & Comrie's (1977) accessibility hierarchy of relativization and Wolfe-Quintero's (1998) two-tier analysis of relative clauses. An analysis of KSL learners' free composition data revealed that KSL learners produced subject relative clauses more frequently than object relative clauses confirming the prediction of Keenan and Comrie's relativization hierarchy. However, KSL learners produced more S-tier types (i.e., relative clauses modifying a subject of the main clause) than O-tier types (i.e., relative clauses modifying an object of the main clause), which does not conform to the Wolfe-Quintero's accessibility hierarchy based on English data. Such tendency was found very similar to that of the native control group. The reason for this is ascribed to the processing difficulty of center-embedding of the relative clauses. It is proposed that the S-tier is easy to process in a left-branching language like Korean while the O-tier is easy in a right-branching language like English. This is due to the avoidance of center-embedded structures which cause processing difficulty and reduce comprehensibility of the sentence. Several kinds of strategies to avoid center-embedding such as *pro*-drop, topicalization, and heavy PP shift were also suggested. The language users seem to try to find ways to reduce the processing load when they have to use complex structures such as relative clauses. This finding supports the perceptual difficulty hypothesis.

Key words: Korean relative clauses, branching direction, center-embedding, *pro*-drop

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1. Introduction

This paper investigates acquisition of Korean relative clauses by KSL (Korean as a Second Language) learners based on writing data. Relative clauses are complex structures which require a higher skill in grammar for L2 learners to use. The acquisition of relative clauses by ESL learners has been studied to show that their developmental order conforms to the Accessibility Hierarchy of relativization proposed by Keenan and Comrie (1977). On the other hand, considering the perceptual difficulty of center-embedding of relative clauses, Wolfe-Quintero (1998) suggested a two-tier analysis of acquisition order. Based on ESL learners' English composition data, she suggested that the acquisition order of relative clauses should be separated depending on the grammatical position of the head noun modified by the relative clauses. In English, she proposes, subject relative clauses modifying object of the main clause (i.e. OS) are easier to acquire than any other relative clause because they avoid center-embedding of the relative clauses and conform to Keenan & Comrie's (1977) accessibility hierarchy.

This paper, taking into consideration the typological difference between Korean and English relative clauses, investigates KSL learners' acquisition of Korean relative clauses, testing two hypotheses: Keenan and Comrie's Accessibility Hierarchy and Wolfe-Quintero's two-tier analysis. Based on KSL learners' free composition data, this paper will discuss the different acquisition order between KSL learners' Korean relative clauses and ESL learners' English relative clauses, ascribing it to the different head direction between the two languages and the perceptual difficulty of center-embedding of relative clauses in terms of sentence processing. Suppression of an overt subject will be discussed as one of the strategies employed by the learners and the native speakers of Korean to avoid center-embedding of relative clauses.

The following section describes the structure of Korean relative clauses compared with English relative clauses relative to the linguistic background. Section 3 reviews previous experimental studies on the acquisition of Korean relative clauses by L1 and L2 learners based on Keenan & Comrie's Accessibility hierarchy. Section 4 discusses Wolfe-Quintero's two-tier analysis and Perceptual Difficulty Hypothesis and introduces the research hypothesis. Section 5 presents data collection and the results of the analysis. Section 6 discusses the results and their implication on the

SLA research of relative clauses; how typological difference of the languages and the processing difficulty of relative clauses affect the learners' acquisition of relative clauses.

2. Korean Relative Clauses

Korean is different from English in various aspects of syntax. Korean is a head-final language (where the complement precedes its head) with SOV word order whereas English is a head-initial language (where the complement follows its head) with SVO word order. Regarding relative clauses, they are located before the head noun in Korean, while after the head noun in English. Consider the following examples:

- (1) a. *Korean*
 Relative clause *Head noun*
 [Mary-ka ____ mek]-un sakwua
 [Mary-NOM ____eat]-ADN apple
 'the apple that Mary ate'
- b. *English*
 Head noun *Relative clause*
 'the apple that [Mary ate__]'

The head noun, *sakwa* ('the apple') is situated after the relative clause, *Mary-ka mek-un*. In addition, the relative clause is connected to its head noun with an adnominal marker (ADN), *-(n)un* in Korean whereas relative pronouns such as *who*, *whom*, *whose*, *which*, or *that* play such a role in English.

Korean allows relativization of all grammatical positions like English excepting genitives and objects of comparison. Consider the following examples from Korean and their corresponding English relative clauses:

- (2) a. [__ sakwa-lul mek]-un namca (Korean: Subject)
 a'. The man who ate an apple (English: Subject)
 b. [namca-ka ____ mek]-un sakwa (Korean: Object)
 b'. The apple that the man ate (English: Object)
 c. [Mary-ka __ sakwa-lul cwu]-un namca (Korean: IO)
 c'. The man to whom Mary gave an apple (English: IO)

- (5) ku namca-**ka** son-i khu-ta.
the man-**NOM** hand-NOM big-DEC.
'The man's hand is big.'
- (6) ku namca-**uy** son-i khu-ta.
the man-**POSS** hand-NOM big-DEC.
'The man's hand is big.'

Another peculiar characteristic of Korean relativization different from English is that Korean allows head-internal relative clauses which are not permitted in English. Consider the following example:

- (7) [Mary-ka **sakwa** mek]-un **kes**
Mary-NOM apple eat-ADN thing
'The apple that Mary ate'

The head *sakwa* is inside of the relative clause and there is a kind of 'place holder' *kes* outside of the relative clause which indicates the *sakwa* in this example. Korean adults as well as children use both head internal relative clauses and head external relative clauses (O'Grady 1998, Cho 1999).

3. Accessibility Hierarchy and Acquisition of Korean Relative Clauses

Keenan & Comrie (1977), based on the typological difference of relativizable positions among languages, proposed Noun Phrase Accessibility Hierarchy as follows:

- (8) *Noun Phrase Accessibility Hierarchy*
Subject > Direct Object > Indirect Object > Object of Preposition >
Genitive > Object of Comparison

The hierarchy is implicational in that the languages which allow relativization of lower position in the hierarchy will allow relativization of the higher position, but not vice versa. Keenan & Comrie (1977), accounting for this hierarchy, propose this hierarchy as a psychologically valid en-

tity, which enables them to predict that the subject is easier to relativize than the object, and so on. From the acquisition point of view, learners are likely to acquire relative clauses in the order of subject to object of comparison without skipping the intermediate positions. The hierarchy has been tested in many studies on L2 acquisition of English with quite positive results (Gass 1980, Eckman et al. 1988, Doughty 1991, Wolfe-Quintero 1992). Similar tendencies were found with different L2 (Hyltenstam 1984: Swedish, Hawkins 1989: French, Ortega 2000: Spanish) and in different situations (Pavesi 1986: uninstructed/instructed learning, Doughty 1991: meaning oriented/rule oriented learning).

The studies on the acquisition of Korean relative clauses by Korean children and adult L2 learners showed similar results, too, confirming the accessibility hierarchy. Kim (1987) and Lee (1991) studied spontaneous speech data from Korean children and found that subject relative clauses were produced earlier than object relative clauses (but, head-internal relative clauses were produced earlier than head-external relative clause). Cho's (1999) experimental data on Korean children's elicited production task and picture comprehension task also showed that subject relative clauses were easier to understand and produce than object relative clauses. However, Lee (1998) showed different results. She did an experimental study involving an elicited imitation task and a picture comprehension task with Korean children and found that indirect object relative clauses were easier to acquire than subject relative clauses, which does not conform to the accessibility hierarchy.

Very few studies on KSL learners' acquisition of relative clause have been done so far. O'Grady et al. (2003) used a picture selection task and an elicited production task to test the asymmetry between subject relative clauses and object relative clauses in KSL learners' acquisition of relative clauses in Korean. They found that the learners comprehended subject relative clauses better than object relative clauses. Similar results were found in Lee & Lee's (2004) study with Korean-Chinese bilingual children. However, Lee et al. (2004) who also studied Korean-Chinese bilingual children's comprehension of Korean relative clauses found the opposite results. They found that object relative clauses were easier to comprehend than subject relative clauses. It is possible that the contradictory findings resulted from the different methodology as mentioned by Lee et al. (2004) and Lee & Lee (2004)².

4. Two-tier Analysis of Relative Clauses (Wolfe-Quintero 1998) and Perceptual Difficulty Hypothesis

Relative clauses can be classified differently depending on the grammatical position of the noun phrases in the main clause that they modify. For example, in *I know the man [who ___ likes Mary]*, a subject relative clause modifies the object of the main clause. This is called the OS type (O indicates the grammatical position of the head noun in the main clause and S indicates the relativized position in the relative clause). More examples are shown in (9):

- (9) *Various combinations of a main clause and a relative clause in English*
- | | |
|--|------|
| a. The man who [___ went to Hawaii] did not come back. | (SS) |
| b. The man who [Mary loves___] went to Hawaii. | (SO) |
| c. Mary loves the man who [___went to Hawaii]. | (OS) |
| d. I know the man who [Mary loves___]. | (OO) |

2) The task in Lee et al.'s (2003) experiment is to choose one of the pictures that describes the relative clauses correctly. For example, there are two sets of pictures to choose from for each question. Let's consider the following hypothetical examples:

- (6) a. [Koyangi-lul cha-nun] wenswungi-ka iss-e-yo.
 'There is a monkey that is kicking a cat'
 b. [Koyangi-ka cha-nun] wenswungi-ka iss-e-yo.
 'There is a monkey that a cat is kicking'

One picture describes a monkey kicking a cat whereas the other picture describes a monkey being kicked by a cat. Children are supposed to pick either of the pictures to match the target item. In this case, children are likely to give answers by understanding only the first two words (i.e., [koyangi-lul cha-nun] or [koyangi-ka cha-nun]) without considering the final head. This can be done without knowledge of the structure of the relative clauses (e. g., knowing the position of the head noun). Furthermore, the children are likely to select the correct picture with object relative clauses because the word order, [SV] matches the canonical word order of Korean [SVO] and agent first strategy, as the authors interpreted the data.

On the other hand, the task of the experiments in O'Grady et al. (2003) and Lee & Lee (2004) requires the children to choose a specific animal in the picture described by the target item (i.e., the head noun), not the whole pictures. In this type of experiment, children not only have to select the picture describing the target relative clauses appropriately but also pick an animal indicated by the head noun of the relative clause.

The different methods like these may result in opposite results, measuring children's knowledge of relative clauses. Lee & Lee (2004) argue that their experimental technique has an advantage to measure children's actual knowledge of relative clauses compared to Lee et al.'s (2003) because it is hard for the children to give right answers in Lee & Lee's (2004) task without knowing the position of the head in the structure of relative clauses, which is different from that of the canonical sentence.

(Other possible combinations (SIO, IOS, OIO, IOO, etc.) are not shown to save space.)

Korean also allows relative clauses to modify various grammatical positions of the main clause similar to English. The Korean examples corresponding to the English examples in (9) are given below.

(10) *Various combinations of a main clause and a relative clause in Korean*

- a. [____Hawaii-ey ka]-n namca-ka tolaoci an-ass-ta. (SS)
'The man who went to Hawaii did not come back.'
- b. [Mary-ka ____salangha]-nun namca-ka Hawaii-ey ka-ass-ta.(SO)
'The man who Mary loves went to Hawaii.'
- c. Mary-nun [____Hawaii-ey ka]-n namca-lul salangha-n-ta. (OS)
'Mary loves the man who went to Hawaii.'
- d. Na-nun [Mary-ka ____ salangha]-nun namca-lul al-n-ta. (OO)
'I know the man who Mary loves.'

Regarding the acquisition of these various types of relative clauses as in (9) and (10), two major hypotheses have been proposed: the Parallel Function Hypothesis (PFH) and the Perceptual Difficulty Hypothesis (PDH). PFH argues that the sentence where the relative pronoun and the head noun have the same grammatical function is easier to process than the other types, predicting the order of SS, OO > OS, SO (that is, SS and OO are easier than SO and OS) (Sheldon 1974, 1976). On the other hand, PDH argues that non-center-embedded relative clauses are easier than center-embedded relative clauses since center-embedded relative clauses interrupt the information flow of the main clause (Kuno 1974).

Center-embedded relative clauses are those that are linearly located in the middle of the main clause such as (9a) and (9b) in English and (10c) and (10d) in Korean whereas non-center-embedded relative clauses are those that are linearly situated in front of or at the end of the main clause such as (9c) and (9d) in English and (10a) and (10b) in Korean. Let's compare processing of the sentences containing these two types of relative clauses in English. Using an example in (9a) as a center-embedded relative clause, the parser needs to hold the subject of the main clause *the man* in the working memory until he or she hits its predicate *did not come back* while processing the center-embedded relative

clause ____ *went to school*, consuming working memory resources. In contrast, such additional processing cost is not required in the processing of sentences containing non-center embedded relative clauses (Gibson 1998, Hiao & Gibson 2003).

Therefore, PDH predicts the acquisition order of OS > OO/SS > SO, that is, OS and OO are easier than SO and SS (Ioup & Kruse 1977, Schumann 1980, Prideaux & Baker 1986, Hamilton 1995, Wolfe-Quintero 1998). In OS and OO types in English with SVO word order, a relative clause modifying an object of the main clause follows the object at the end of the sentence, without interrupting the information flow.

Due to the disagreement among studies about the acquisition order of relative clauses involving a main clause (i.e. SS, SO, OS, OO, etc.), a new proposal has been made by Wolfe-Quintero (1998). She found that ESL learners' English writing data were also consistent with the predictions of the accessibility hierarchy. More specifically, she determined the level by a complexity measure: the number of finite clauses per main clause (FC/MC) (See Wolfe-Quintero (1998) for details) and investigated the use of the relative clause by ESL learners with various language backgrounds. As a result, she proposed the two-tiered relative clause hierarchy for ESL learners' development of English relative clauses depending on the grammatical status of the head noun in the main clause as follows:

- (11) OS > OO > OADV > OOP (O-tier)
 SS > SO > SADV > SOP (S-tier)

The main point in this hierarchy is that OS is easier to acquire than OO and SS. Wolfe-Quintero suggests that OS is the easiest, considering the Perceptual Difficulty Hypothesis (i.e. OS does not involve center-embedding in English) and Keenan and Comrie's Accessibility Hierarchy (i.e. subject relative clauses are easier than object relative clauses). The two-tier analysis is supported by Oh's (2000) study. Investigating the generalization of instruction on relative clauses with Korean learners of English, she found that generalization of the instruction did not occur across tiers. She gave an instruction on object-of-preposition relative clauses expecting the generalization of the instruction to occur on the higher position in the Keenan and Comrie's hierarchy, that is, subject and object position across tiers. Her results show that the instruction given

on the S-tier (i.e., relative clauses modifying a subject of the main clause) is not generalized into the O-tier (i.e., relative clauses modifying an object of the main clause) and vice versa, which is shown in (12).

(12) Group Gain Scores by Tier Type (Adopted from Table 5, Oh 2000:31)

Instruction group	O-tier	S-tier
OO Group	2.40	.92
OOP Group	2.48	.78
SO Group	.77	3.61
SOP Group	.08	4.08

(12) indicates that OO and OOP groups who were given an instruction on OP relative clauses gained better score in the O-tier relative clauses (2.40, 2.48) than in the S-tier relative clauses (.92, .78) on the post-test after OP instruction. In contrast, SO and SOP groups obtained better score in the S-tier relative clauses (3.61, 4.08) than in the O-tier relative clauses (.77, .08). This means that the instruction is not effective across tiers.

As Wolfe-Quintero's two-tier analysis is based on English data, this paper attempts cross-linguistic comparison of the analysis. If the order of acquisition of relative clauses based on the approach integrating perceptual difficulty hypothesis and Noun Accessibility Hierarchy Hypothesis is correct, we may expect a different order in the different types of languages, especially left-branching languages. As mentioned in Section I, OS type of relative clauses involves center-embedding in Korean because (i) Korean employs SOV word order, and (ii) the relative clause is located before its head noun. Therefore, OS, which was the easiest type to acquire in English, is not the easiest one in Korean. On the other hand, relative clauses that modify a subject of the main clauses (e. g. SS, SO) do not involve center-embedding in Korean, as illustrated in the following diagram:

- (13) The location of relative clauses in Korean
- | | |
|----------------------------------|-----------------|
| S [<i>Relative clause</i>] O V | O-tier (OS, OO) |
| [<i>Relative clause</i>] S O V | S-tier (SS, SO) |

Therefore, this approach brings us to the following research hypotheses:

(14) Research Hypotheses

- a. KSL learners will use relative clauses in the order of Subject > Object > Oblique (i.e. Keenan and Comrie's accessibility hierarchy will be supported in KSL learners' use of Korean relative clauses because it does not involve the grammatical role of the head noun in the main clause)
- b. KSL learners will use more SS than OS (i.e. Wolfe-Quintero's hierarchy for English, OS > SS will not be supported in KSL learners' use of Korean relative clauses).

To compare the data of this study with Wolfe-Quintero's study based on ESL learners' free composition data, KSL learners' writing data were collected for the study. Even though the present study is limited to free composition data, not highly controlled elicited oral production data or comprehension data, the results are assumed to conform to those data based on the Wolfe-Quintero's finding of the correlation between the complexity of the writing and the development of relative clauses.

5. The Study

5.1. Subjects

17 English-speaking KSL learners and 11 Korean native speakers participated in this study. The learners were undergraduate students at the University of Hawaii at Manoa enrolled in an intermediate Korean language class. The native speakers were graduate students enrolled in the University of Hawaii at Manoa, except for one from Hawaii Pacific University.

5.2. Method

Each of the learners was given a piece of paper and asked to write an essay about the same topic (See the appendix for the topic), and this task was done as a group for 30 minutes during the class time. The experimenter sometimes assisted the subject with difficult vocabulary they wanted to use as long as it was not thought to affect the purpose of the experiment. The Korean native speakers were asked to do the same task with the same topic, but they performed the task at home individually.

However, they were asked to write one and a half pages in about 30 minutes.

5.3. Results

First, a total of 186 relative clauses were found and analyzed depending on the relativized position and the results are shown in Table 1.

Table 1. Frequency of Relative Clauses

	Subj-R	Obj-R	Obl-R	Total
Subject	N/%	N/%	N/%	N/%
Learners (17)	65/79	10/12	7/9	82/100
Natives (11)	72/69	23/22	9/9	104/100
Total (28)	137/74	33/18	16/8	186/100

(Obl-R includes object-of-preposition relative clauses and indirect object relative clauses.)

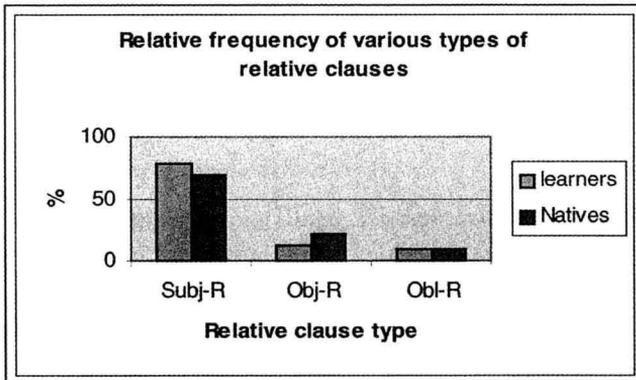


Figure 1. Relative frequency of various types of relative clauses

Comparing the number of each type of relative clause, both the learners and the native speakers used subject relative clauses a lot more than object relative clauses or oblique relative clauses. A statistical analysis with repeated measures revealed that the mean differences among the different types of relative clauses were statistically significant ($F(1, 26) = 35.520, p < .005$). However, there was no interaction effect between the relative clause type and the subject type ($F(1.26) = 2.280, p = .143$), which means that the learners' behavior was similar to the native speakers' in

the use of relative clauses in terms of relative frequency of different types of relative clauses. Because of the similarity of the behavior between the two groups, the data from both learners and the native speakers were combined, and a paired sample T-test was conducted on them. It was found that the differences between three pairs (i.e., Subj-R vs. Obj-R; Subj-R vs. Obl-R; Obj-R vs. Obl-R) were statistically significant ($t = 5.187$ two-tailed, $p < .005$; $t = 5.687$, two-tailed, $p < .005$; $t = 2.300$, two-tailed, $p = .029$ respectively). Our results conform to Keenan & Comrie's Accessibility Hierarchy of relativization.

Next, all the sentences containing a relative clause were analyzed depending on the grammatical position of the head noun of the relative clause at the main clause. For example, S-tier means that the embedded relative clause modifies the subject of the main clause. The results are shown in Table 2.

Table 2. Tier Analysis of Relative Clauses

Subject	S-tier	O-tier	C-tier	Obl-tier	Total
	N/%	N/%	N/%	N/%	N/%
Learner (17)	27/41	14/21	20/30	5/8	66/100
Native (11)	37/39	24/25	19/20	16/16	96/100
Total (12)	64/40	38/23	39/24	21/13	162/100

(C-tier: Complement of BE-verb, Obl-tier: Object-of-preposition or indirect object. A couple of G-tier (relative clauses modifying genitive) were also found but are not included in the analysis.)

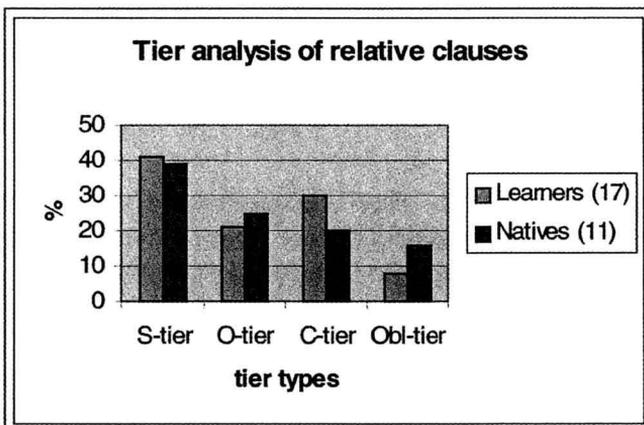


Figure 2. Tier analysis of relative clauses

Comparing the frequency of each tier, the S-tier is more frequent than the O-tier, the C-tier, and the Obl-tier. However, the difference between the O-tier and the C-tier looks trivial. A statistical analysis with repeated measures was conducted to show that the effect of tier-type was significant ($F(1,26) = 11.497, p = .002$). However, no interaction effect between the tier-type and the speaker-type was found. ($F(1, 26) = 1.387, p = .251$). This indicates that the learners' behavior is similar to the native speakers in the use of relative clause in terms of the relative frequency of different types of tiers. Because the difference between the two groups was statistically non-significant, a paired samples T-test was conducted with the combined data from the two groups to find mean differences among the four types of relative clauses. The results are presented in Table 3.

Table 3. Paired Differences Among Different Tier Types

Pair No.	Pair	Paired Differences				df	Sig. (2-tailed)
		Mean	SD	SEM	t		
1	STier - OTier	0.8214	2.3891	0.4515	1.819	27	0.08
2	STier - CTier	0.6786	3.5072	0.6628	1.024	27	0.315
3**	STier - OblTier	1.7143	2.3705	0.448	3.827	27	0.001
4	OTier - CTier	-0.1429	3.461	0.6541	-0.218	27	0.829
5*	OTier - OblTier	0.8929	1.7286	0.3267	2.733	27	0.011
6	CTier - OblTier	1.0357	2.7418	0.5181	1.999	27	0.056

* $p < .05$

** $p < .005$

Statistically significant mean difference is found only in Pair 3 and Pair 5. Still, the mean differences in Pairs 1 and 6 are not negligible, compared to Pairs 2 and 4. It is possible that we could find statistically significant mean differences in the former pairs with more data from larger samples.

According to the results in Table 3, it can be said that the S-tier is easier to use than the O-tier or the Obl-tier. The results do not conform to Wolfe-Quintero's acquisition order, where the opposite direction was suggested (i.e., the O-tier precedes the S-tier). In Korean, the S-tier seems easier to acquire than the other tiers.

In order to find the relative frequency of each type of relative clause in each tier, every type of relative clause in each tier was counted and the results are shown in Table 4, 5, 6, and 7.

Table 4. Relative Clauses in S-tier

Subject	SS	SO	SObl	SC	Total
	N/%	N/%	N/%	N/%	N/%
Learner (17)	16/55	9/31	4/14	0/0	29/100
Native (11)	29/73	5/12	6/15	0/0	40/100
Total (28)	45/65	14/20	10/14	0/0	69/100

Frequency order (in total): S (S > O > Obl > C)

Table 4 shows that in the S-tier, the learners and the native speakers showed very similar behavior: both the groups used SS more frequently than the other types. In total, the frequency order among the four types can be summarized roughly as SS > SO, SObl > SC. A statistical analysis with repeated measures showed that there was relative clause type effect among the mean differences ($F(1, 26) = 17.418, p < .005$), but no interaction effect between the relative clause type and the subject type ($F(1, 26) = 3.300, p = .081$). This indicates that the learners' behavior was similar to the native speakers' in the use of S-tier relative clauses. Because the difference between the two groups was statistically non-significant, a paired samples T-test was conducted with the combined data from the two groups to find mean differences among the four types of relative clauses. Statistically significant mean differences were found in the five pairs out of six: SS-SO ($t(27) = 2.868, 2$ -tailed, $p = .008$), SS-SC ($t(27) = 2.868, 2$ -tailed, $p < .005$), SS-SObl ($t(27) = 3.350, 2$ -tailed, $p = .002$), SO-SC ($t(27) = 3.154, 2$ -tailed, $p = .004$) and SC-SObl ($t(27) = -2.585, 2$ -tailed, $p = .015$).

Table 5. Relative Clauses in O-tier

Subject	OS	OO	OObl	OC	Total
	N/%	N/%	N/%	N/%	N/%
Learner (17)	15/83	1/6	2/11	0/0	18/100
Native (11)	18/64	9/32	1/4	0/0	28/100
Total (28)	33/72	10/22	3/7	0/0	46/100

Frequency order (in total): O (S > O > Obl > C)

Table 5 shows that in the O-tier, both the learners and the native speakers showed similar behavior in that both the groups used OS more frequently than the other types. Among the other three types (i.e., OO, OObl and OC), on the other hand, the OO was found more frequently

than the OObl and the OC in the native speakers' data whereas all of them were very sparse in the learners' data. In total, the frequency order among the four types can be summarized roughly as OS > OO > OObl > OC. A statistical analysis with repeated measure showed that there was a relative clause type effect among the mean differences ($F(1, 26) = 19.085$, $p < .005$), but no interaction effect between the relative clause type and the subject type ($F(1, 26) = 3.012$, $p = .094$). This indicates that the learners' behavior was similar to the native speakers' in the use of O-tier relative clauses. Again, because the difference between the two groups was statistically non-significant, a paired samples T-test was conducted with the combined data from the two groups to find mean differences among the four types of relative clauses. Statistically significant mean differences were found in the four pairs out of six: OS-OO ($t(27) = 3.129$, 2-tailed, $p = .004$), OS-OC ($t(27) = 4.180$, 2-tailed, $p < .005$), OS-OObl ($t(27) = 3.746$, 2-tailed, $p = .001$) and OO-OC ($t(27) = 2.785$, 2-tailed $p = .010$).

Table 6. Relative Clauses in C-tier

Subject	CS	CO	CObl	CC	Total
	N/%	N/%	N/%	N/%	N/%
Learner (17)	29/97	0/0	1/3	0/0	30/100
Native (11)	17/85	2/10	1/5	0/0	20/100
Total (28)	46/92	2/4	2/4	0/0	50/100

Frequency order in total: C (S > O, Obl > C) (Here, the total number of C-tiers is different from that in Table 2 because of the different calculation. The case where two relative clauses modified one head noun was counted as two in this table.)

Table 6 shows that in the C-tier, both the learners and the native speakers showed similar behavior in that both the groups used CS much more frequently than the other types. Compared to CS, the other three types were very rare in both groups. In total, the frequency order among the four types can be summarized roughly as CS > CO, CObl, CC. A statistical analysis with repeated measures showed that there was a relative clause type effect among the mean differences ($F(1, 26) = 10.163$, $p = .004$), but no interaction effect between the relative clause type and the speaker type ($F(1, 26) = .018$, $p = .895$). This indicates that the learners' behavior was similar to the native speakers' in the use of C-tier relative

clauses. Again, because of the similarity between the two groups, a paired samples T-test was conducted with the combined data from the two groups to find mean differences among the four types of relative clauses. Statistically significant mean differences were found in the three pairs out of six CS-CO ($t(27) = 3.325$, 2-tailed, $p = .003$), CS-CC ($t(27) = 3.501$, 2-tailed, $p = .002$), and CS-CObl ($t(27) = 3.306$, 2-tailed, $p = .003$).

Table 7. Relative Clauses in Obl-tier

Subject	OblS	OblO	OblObl	OblC	Total
	N/%	N/%	N/%	N/%	N/%
Learner (17)	5/100	0/0	0/0	0/0	5/100
Native (11)	8/50	7/44	1/6	0/0	16/100
Total	13/62	7/33	1/5	0/0	21/100

Frequency order in total: Obl (S > O > Obl > C)

Table 7 shows that both the learners and the native speakers used OblS most frequently in Obl-tier. OblS was the only structure used by the learners whereas it was used almost as frequently as OblO by the native speakers. OblObl and OblC were rare in both groups. In total, the frequency order among the four types can be summarized roughly as OblS > OblO > OblObl > OblC. A statistical analysis with repeated measures showed that there was a relative clause type effect among the mean differences ($F(1, 26) = 17.820$, $p < .005$), but no interaction effect between the relative clause type and the subject type ($F(1, 26) = 4.195$, $p = .051$). This indicates that the learners' behavior was similar to the native speakers' in the use of Obl-tier relative clauses. Because the difference between the two groups was statistically non-significant, a paired samples T-test was conducted with the combined data from the two groups to find mean differences among the four types of relative clauses. Statistically significant mean differences were found in the four pairs out of six, OblS-OblC ($t(27) = 3.545$, 2-tailed, $p = .001$), OblS-OblObl ($t(27) = 3.286$, 2-tailed, $p = .003$), OblO-OblC ($t(27) = 2.049$, 2-tailed, $p = .050$), and OblO-OblObl ($t(27) = 2.274$, 2-tailed, $p = .031$).

To summarize, the relative frequency of the four types of relative clauses in each tier is as follows.

(15) *Relative frequency of relative clauses in each tier*

- S-tier: SS > SO > SObl > SC
 O-tier: OS > OO > OObl > OC
 C-tier: CS > CO, CObl > CC
 Obl-tier: OblS > OblO > OblObl > OblC
 ('>' means 'is more frequent than')

The frequency order in (15) shows that a subject is most frequently relativized regardless of the grammatical position of its head noun in the main clause, which, again, supports Keenan and Comrie's (1977) Accessibility Hierarchy.

Comparing the frequency order in (15) with Wolfe-Quintero's relativization hierarchy repeated in (16), the hierarchy of relative clauses in each tier in KSL learners' Korean composition data conforms to her hierarchy. For example, OS is easier than OO in the O-tier and SS is easier than SO in S-tier in both (15) and (16).

- (16) OS > OO > OADV > OOP
 SS > SO > SADV > SOP

However, comparing the S-tier with the O-tier, KSL learners' data do not conform to her hierarchy. First of all, SS was more frequent than OS (45 vs. 33), which is contrary to Wolfe-Quintero's English data, where OS is higher than SS in her hierarchy in (16). Even more crucially, comparing OO and SS, the number of SS is much bigger than that of OO in KSL learners' data (i.e., 45 vs. 10), which does not conform to Wolfe-Quintero's hierarchy, either, where both of them are similar.

In sum, Wolfe-Quintero's (1998) Accessibility Hierarchy based on English relative clauses is partially confirmed by KSL learners' writing. The individual hierarchies of the S-tier and the O-tier were confirmed. Strictly speaking, it can be said that Keenan & Comrie's Hierarchy was confirmed with Korean data. However, the relative order of the two tiers is different in the two languages, that is, the S-tier (SS and SO) was preferred over the O-tier (OS and OO) in Korean data, contrary to Wolfe-Quintero's English data.

6. Discussion

6.1. Head Direction, Word Order and Relative Clauses

First of all, KSL learners' use of relative clauses is similar to native speakers' in the free composition in terms of the relative frequency of different types of relative clauses. Both learners and native speakers of Korean used subject relative clauses more frequently than object relative clauses and oblique relative clauses. However, comparing the total number of relative clauses in each group, the learners used relative clauses almost twice less than the native speakers. The average number of relative clauses used by the learners in this task was about five whereas that by the native speakers was 9.5 (See Table 1). It seems to show that relative clauses are a difficult construction for the learners to use.

Second, Keenan and Comrie's (1977) Accessibility Hierarchy of Relativization (especially asymmetry between subject relative clause and object relative clauses) was supported by KSL learners' writing data, because both the learners and the native speakers used subject relative clauses a lot more than object relative clauses (total 74% : 18% in Table 1). The frequency order between the object relative clause and the oblique relative clause also conforms to the Keenan and Comrie's hierarchy (Oblique includes indirect object as well as object of preposition in this study).

Third, there were several types of subject relative clauses (SS, OS, CS, Obs) used by learners as well as native speakers. However, in the case of object relative clauses, only two types (SO and OO) were used by learners, whereas four types (SO, OO, CO, and OblO) were used by native speakers. Interestingly, the C-tier was frequent, which might result from the type of task or the topic (considering the topic, it is likely to use the phrase, *one of my friends is the one that--*, where the relative clause modifies the complement of BE verb. See Appendix for the topic).

Wolfe-Quintero's relativization hierarchy for English was also found in KSL learners' data in each tier as shown in Table 4, 5, 6, and 7. However, when we compare the S-tier and the O-tier, the S-tier seems to be easier to use than the O-tier for KSL learners. The reason for this seems relate to the difference of branching-direction between English and Korean. In English, a right-branching language, the relative clause modifying a subject of the main clause (which is at the beginning of the sentence) can be hard to process. We have to hold the subject NP in the working

memory until we reach the main verb, which consumes the integration resources (Gibson 1999, Hsiao & Gibson 2003). In contrast, we need less integration resources in the O-tier because the relative clause does not intervene the elements of the main clause. On the other hand, in Korean, which is a left-branching language, the relative clause modifying an object of the sentence can be hard to process because we have to hold the subject in the working memory while we process the object-modifying relative clause and reach the verb. In other words, the O-tier has a right-branching structure whereas the S-tier has a left-branching structure. Therefore, it can be said that the S-tier is easier to process in a left-branching language like Korean whereas the O-tier is easy to process in a right-branching language like English (Mazuka & Lust 1990).

For example, let's compare SS (S-tier) and OO (O-tier) because the difference in the frequency of the two types was quite noticeable both in KSL learners' and in native speakers' data (total 45:10). Consider the following examples:

(17) SS in Korean and English

- a. [___ **Jane-lul cohaha-nun**] namca-ka ttenassta (Korean)
 ___ Jane-ACC like-ADN man-NOM left.
 'The man that loves Jane left.'
- b. The man [**that ___ loves Jane**] left. (English)

(18) OO in Korean and English

- a. Jane-i [**Mary-ka ___ cohaha-nun**] namca-lul po-ass-ta. (Korean)
 Jane-NOM[Mary-NOM ___ like-ADN] man-ACC see-PAST-DEC.
 'Jane saw the man that Mary likes.'
- b. Jane saw the man [**that Mary likes ___**]. (English)

The examples in (17) show that SS relative clauses are at the beginning of the sentence in Korean as in (17a) whereas they are center-embedded in English as in (17b), interfering processing of the main clause. The examples in (18) show that OO relative clauses are center-embedded in Korean as in (18a), interfering with the processing of the main clause, whereas they are at the end of the sentence in English as in (18b), without interrupting processing of the main clause.

6.2. Subject-drop and Relative Clauses

From this processing perspective, the S-tier should be more frequent than the other tiers in Korean. In addition, the O-tier and the C-tier should be problematic in Korean and the S-tier in English because they are center-embedded structures in these languages respectively. In this sense, our data may look problematic because the total proportion of the O-tier, the C-tier and the Obl-tier is big (23%: 24% and 13% respectively, total 60%), compared to the proportion of S-tier (40%) (See Table 2).

However, we need to consider the fact that Korean is a pro-drop language, where the subject can be omitted in the sentence without violating grammaticality of the sentence. It is thought plausible to propose that the O-tier, the C-tier and the Obl-tier do not cause any problem in processing if the main clause does not have an overt subject. Without an overt subject, they are not center-embedded structures any longer on the surface. In order to find any tendency that *pro* (dropped subject) is used in the main clause when it has O-tier, C-tier or Obl-tier relative clauses, the data were reanalyzed depending on the type of the subject of the main clause. The results are shown in Table 4.

Table 8. Subject in the Main Clause

Tier	Subject	<i>Pro</i>	Topic M	NOM	No case marker	Total
		N/%	N/%	N/%	N/%	N/%
S-tier	L	0/0	4/15	21/78	2/7	27/100
	N	0/0	9/24	28/76	0/0	37/100
O-tier	L	8/57	5/36	1/7	0/0	14/100
	N	16/67	8/33	0/0	0/0	24/100
C-tier	L	9/45	8/40	3/15	0/0	20/100
	N	9/47	10/53	0/0	0/0	19/100
Obl-tier	L	3/60	1/20	1/20	0/0	5/100
	N	8/50	4/25	3/19	1/6	16/100

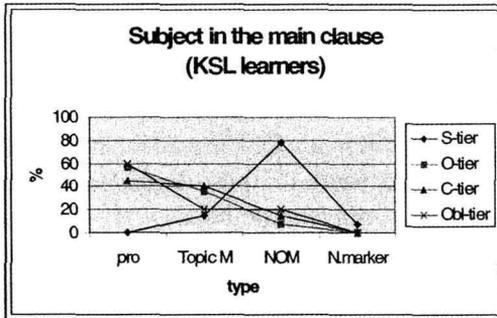


Figure 3. Subject in the main clause (Learners')

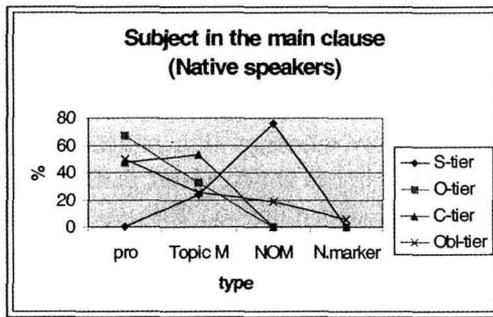


Figure 4. Subject in the main clause (Native speakers')

First, Table 8 shows that both learners and the native speakers demonstrated similar behavior in that Nominative was most frequent in the S tier whereas *pro* was most frequently found in all the other cases (the O-tier, the C-tier and the Obl-tier). In other words, the subject was suppressed when the object, the complement of BE-verb and the oblique of the main clause were modified by a relative clause, thereby avoiding center-embedding of the relative clauses. In addition, even though it is possible to have double nominative cases in a simple sentence in Korean (as explained in Section 2), no such cases are found when the subject of the sentence is modified by a relative clause in our data.

A statistical analysis with repeated measures was conducted for each tier to show that mean differences among different types of subjects in the main clause were statistically significant in each tier (S-tier: $F(1, 26) = 10.423$, $p = .003$, O-tier: $F(1, 26) = 28.277$, $p < .005$, C-tier: $F(1, 26) = 15.108$, $p < .005$, Obl-tier: $F(1, 26) = 11.789$, $p < .002$), but there was no interaction effect between the subject type in the main clause and the speaker type across

tiers (S-tier: $F(1, 26) = .154$, $p = .698$, O-tier: $F(1, 26) = 7.387$, $p = .012$ C-tier: $F(1, 26) = 1.205$, $p = .282$, Obl-tier: $F(1, 26) = 3.985$, $p = .056$). This means that the KSL learners' behavior is similar to the native speakers' in the use of subject in the main clause in each tier.

Because similar tendency was found between the learners and the native speakers, the data from both groups were combined together, and a paired samples T-test was conducted for each tier to find mean differences among the four types of subject in the main clause.

The results showed that in the S-tier, the mean differences between Pro and TopicM and between Pro and NOM were statistically significant ($t(27) = 2.458$, 2-tailed, $p = .021$ and $t(27) = 4.232$, 2-tailed, $p < .005$ respectively). The same tendency was also found in the O-tier (Pro-TopicM: $t(27) = 2.174$, 2-tailed, $p = .039$, Pro-NOM: $t(27) = 4.116$, 2-tailed, $p < .005$). In the C-tier, the mean difference was statistically significant between Pro and NOM ($t(27) = 2.491$, 2-tailed, $p = .019$), but non-significant between Pro and TopicM ($t(27) = .000$, 2-tailed, $p = 1.000$). In the Obl-tier, neither of the pairs showed statistically significant mean differences (Pro-TopicM: $t(27) = 1.232$, 2-tailed, $p = .227$, Pro-NOM: $t(27) = 1.491$, 2-tailed, $p = .148$). This may be due to the low frequency of the O-tier in our data.

To summarize, frequent use of *pro* was found in the O-tier, the C-tier and the O-tier, avoiding center-embedding of the relative cause in overt-syntax.

Second, there is a difference between the nominative case marker (NOM) and the topic marker (TopicM) in terms of their distribution in each tier. The mean differences between TopicM and NOM were statistically significant in all the tiers except for the Obl-tier which, again, was rare in our data (S-tier: $t(27) = 2.870$, 2-tailed, $p = .008$, O-tier: $t(27) = 2.870$, 2-tailed, $p = .008$, C-tier: $t(27) = 2.647$, 2-tailed, $p = .013$).

However, the relative frequency order between the TopicM and NOM in the O-tier and the C-tier differs from that in the S-tier. In the former where an overt subject appears in the main clause (i.e., the O-tier and the C-tier), the subject is more likely to be realized as a topic rather than as a nominative case. This seems to indicate that a topic does not block sentence processing if we think of it as an element moved out of the basic sentence structure³). In contrast, in the S-tier where a subject is modi-

3) Topicalization is a transformation that moves an element to the beginning of the sentence to make it a topic of the conversation in general. For example, in sentence *The boy*,

fied by a relative clause, the subject is more likely to be realized as a nominative case than as a topic (78% vs. 15% in the learners' and 76% vs. 24 % in the native speakers'). This seems to show that the S-tier does not cause processing load. Furthermore, this suggests different roles of topic marker and nominative case marker in sentence processing.

Third, among the Obl-tiers, two cases were found that the whole PP (i.e. postpositional phrase), [relative clause + head NP + postposition], were moved to the front of the main clause, avoiding center-embedding of the relative clauses, like a heavy NP shift in English.

Frequency of the S-tier relative clauses over the O-tier, the C-tier, and the Obl-tier relative clauses and especially the suppression of the overt subject in the main clause with these relative clauses lead us to the following generalization:

(19) *Relative clauses and branching-direction*

Relative clauses tend to be located at the beginning of a sentence in a left-branching language like Korean, whereas they tend to be located at the end of a sentence in a right-branching language like English.

This generalization conforms to the PDH (Perceptual Difficulty Hypothesis) suggested by Kuno (1974), where he claims that *center-embedding, not left- or right-embedding, reduces the comprehensibility of sentences* (p. 119), first observed by Chomsky (1961). Our data from the Korean support Kuno's idea and vice versa.

In order to confirm such tendency to avoid center-embedding of relative clauses, the data were reanalyzed depending on center-embeddedness and non-center-embeddedness of each relative clause. The results are shown in Table 9 and Figure 5.

I have met, the direct object *The boy* is topicalized. A topic marker, *-nun* (meaning *as for, concerning*) is attached to the topicalized element in Korean. See (Sohn 1999, P347) for more detailed description of the topic marker in Korean. In this paper, topicalized subject was not analyzed as center-embedding because it is moved out of the main clause.

Table 9. Means of Center-embedding and Non-center Embedding

Tier	Subject	Center-embedding	Non-Center-embedding	Total
		N/%	N/%	N/%
S-tier	L	0/0	27/100	27/100
	N	0/0	37/100	37/100
O-tier	L	6/43	8/57	14/100
	N	8/33	16/67	24/100
C-tier	L	11/55	9/45	20/100
	N	10/53	9/47	19/100
Obl-tier	L	2/40	3/60	5/100
	N	8/50	8/50	16/100
Total	L	19/29	47/71	66/100
	N	26/27	70/73	96/100

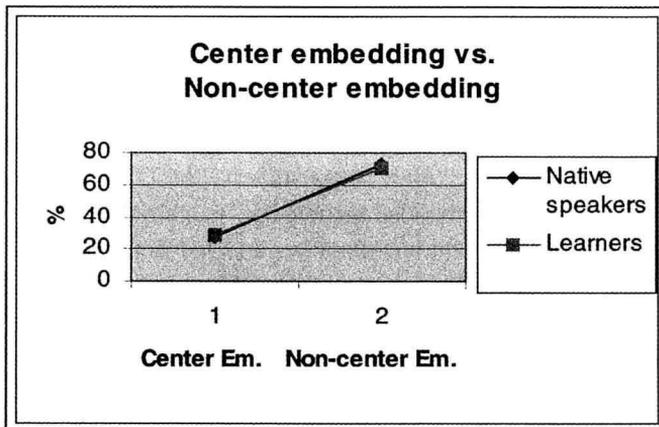


Figure 5. Center embedding vs. Non-center embedding of relative clauses

About 70% of the relative clauses are non-center-embedded clauses whereas only about 30% of the relative clauses are center-embedded clauses in both learners' and native speakers' use of Korean relative clauses. The mean difference between center-embedding and non-center-embedding was statistically significant ($F(1, 26) = 25.414, p < .005$). In addition, there was a slight interaction effect between embedding type and the speaker type ($F(1, 26) = 4.412, p = .046$), which indicates that the mean difference between native speakers' and KSL learners' use of center-

embedded and non-center embedded relative clauses was statistically significant.

Table 10. Means of Center-embedding and Non-center-embedding

Subject (N)	Center-embedding	Non-center-embedding
KSL learners (17)	1.1176	2.7647
Native speakers (11)	2.3636	6.3636
Total (28)	1.6071	4.1786

The native speakers used relative clauses about three times more frequently than the learners in the 30-minute-long free composition. Two reasons are possible for this: i) the learners' composition was relatively short and ii) the learners might have avoided complex structures such as relative clauses. It can be said that this indicates the learners' lower language proficiency than the native speakers'.

The results that both the learners and the native speakers preferred non-center-embedded relative clauses over the center-embedded ones support our generalization in (19).

To summarize, it was found that both Korean native speakers and KSL learners preferred the S-tier relative clauses (i.e., a non-center embedded structure) over the other types such as the O-tier, the C-tier, and the Obl-tier (i.e., center-embedded structures). In particular, when the latter tiers were used, both native speakers and learners employed several strategies such as suppression of an overt subject, use of topic instead of nominative case subject, and heavy PP shift, avoiding center-embedding of the relative clause.

7. Conclusion

I have discussed the acquisition of Korean relative clauses by KSL learners in terms of the two kinds of accessibility hierarchies of relativization proposed by Keenan & Comrie (1977) and Wolfe-Quintero (1998), based on free composition data. It was found that KSL learners produced subject relative clauses more than object relative clauses confirming the prediction of Keenan and Comrie (1977). However, KSL learners produced the S-tiers more than the O-tiers, which does not conform to the Wolfe-Quintero's accessibility hierarchy based on English data. The reason for

this is ascribed to the processing difficulty of center-embedded structure and its relation to the branching direction of the language. The generalization I propose here is that the S-tier is easy to process in a left-branching language like Korean whereas the O-tier is easy in a right-branching language like English. This generalization agrees to the perceptual difficulty hypothesis that center-embedding of the relative clause causes processing difficulty and reduces comprehensibility of the sentence. Several kinds of strategies to avoid center-embedding such as *pro*-drop, topicalization, and heavy PP shift were also discussed. The language users seem to try to find ways to reduce the processing load when they have to use complex structures such as relative clauses.

From a point of view of L2 acquisition, one might argue that the learners' preference order found in this study may not reflect the learners' actual knowledge of relative clauses because our study is based on the free composition data.⁴⁾ We acknowledge that further research is called for involving more controlled elicited production task such as structure building task to confirm the findings of our study. Nevertheless, taking into consideration the finding that preference order was parallel to the perceptual difficulty hypothesis, there is the strong possibility that a similar acquisition order be found in the further research. Indirect evidence can be found from L1 acquisition of Korean relative clauses. Clancy et al.'s (1986) comprehension study with Korean children found that SS and SO (in fact, SS > SO) were comprehended better than OS and OO when presented in SOV word order in their act-out task. In contrast, presented in OSV word order, the opposite order was found (OO, OS > SS, SO). This finding is consistent with our generalization in (19). A similar tendency was also reported in Japanese children (Harada et al. 1976 for example), another head-final language with SOV word order like Korean. Further research in this line with various target languages in relation to the universal processing strategies will enhance our understanding of the acquisition of relative clauses in SLA.

4) For example, native speakers' preference order will not reflect their relative knowledge of the relative clauses in their mother tongue.

Appendix

Writing

Please imagine you have two friends who are very close to you (You may think of your actual friends). Their personalities are very different from one another. Please describe their personalities in detail. For example, you may think about what they like or what they dislike; what they like to do or what they don't like to do. Next, imagine they want to find a boyfriend or girlfriend. If they come to you for advice, what type of person would you recommend to each friend? Why? (Please write as much as possible in **Korean**)

References

- Cho, S. (1999). *The acquisition of relative clauses: Experimental studies on Korean*. Unpublished doctoral dissertation, University of Hawaii at Manoa.
- Chomsky, N. (1961). On the Notion 'Rule of Grammar', *Proceedings of the Twelfth Symposium in Applied Mathematics*. The American Mathematical Society, Providence, R.I. 12, 6-24
- Clancy, P. M., H-J. Lee & M-H. Zoh. (1986). Processing strategies in the acquisition of relative clauses: Universal principles and language-specific realizations. *Cognition* 24, 225-262.
- Doughty, C. (1991). Second language instruction does make a difference: evidence from an empirical study of ESL relativization, *Studies in Second Language Acquisition* 13(4), 431-469.
- Eckman, F., L. Bell & D. Nelson. (1988). On the generalization of relative clause instruction in the acquisition of English as a second language. *Applied Linguistics* 9, 1-20.
- Gass, S. (1980). An investigation of syntactic transfer in adult second language learners, In R. Scarcella & S.D. Crashen (Eds.), *Research in second language acquisition: Selected papers of the Los Angeles Language Acquisition Research Forum* (pp.132-141).
- Gibson, E. (1998). Linguistic complexity: locality of syntactic dependencies. *Cognition* 69, 1-76.
- Hamilton, R. (1994). Is implicational generalization unidirectional and maximal? Evidence from relativization instruction in a second

language. *Language Learning* 4, 123-157.

- Harada, S. I., T. Uyeno, H. Hayashibe & H. Yamada (1976). On the development of perceptual strategy in children: a case study on the Japanese child's comprehension of the relative clause construction. *Annual Bulletin of the Research Institute Logopedics Phoniatrics, (University of Tokyo)* 10, 199-22.
- Hawkins, R. (1989). Do second language learners acquire restrictive relative clauses on the basis of relational or configuration information? The acquisition of French subject, direct object, and restrictive relative clauses by second language learners. *Second Language Research* 5, 155-188.
- Hsiao, F. & E. Gibson. (2003). Processing relative clauses in Chinese. *Cognition* 90, 3-27.
- Hyltenstam, K. (1984). The use of typological markedness conditions as predictors in second language acquisition: The case of pronominal copies in relative clauses. In R. Andersen (eds.) *Second languages: A cross-linguistic perspective*. Rowley, MA: Newbury House.
- Ioup, G. & A. Kruse. (1977). Interference versus structural complexity in second language acquisition: Language universals as a basis for natural sequencing In J. K. Brown, C. A. Yorio & R. H. Crymes (eds.) *On TESOL 77-Teaching and Learning English as a Second Language: Trends in Research and Practice*. Washington, D.C.: Teacher of English to Speakers of Other Languages.
- Keenan, E. L., & B. Comrie. (1977). Noun phrase accessibility and universal grammar, *Linguistic Inquiry* 8(1), 63-99.
- Kim, Y.-J. (1987). *The acquisition of relative clauses in English and Korean: Development in spontaneous production*. Ed.D. Doctoral dissertation. Harvard University.
- Kuno, S. (1974). The position of relative clauses and conjunctions. *Linguistic Inquiry* (1), 117-136.
- Lee, H.-S. (1998). The structure of noun-complement complementation in Korean from a typological point of view, *ICKL Proceedings* (pp.94-103).
- Lee, K.-O. (1991). *The first acquisition of relative clauses in Korean: The universal structure of COMP*. Doctoral dissertation. Cornell University.
- Lee, K.-O., J.-S. Jun & H.-W. Park. (2004). Quantitative differences in the processing of relative clauses between monolingual and bilingual speakers. *Discourse and Cognition* 11(1), 215-236.

- Lee, K.-O. & S.-Y. Lee. (2004). Korean-Chinese bilingual children's comprehension of Korean relative clauses: rethinking of the structural distance hypothesis. *Language Research* 40(4), 1059-1080.
- Lee, M.-S. (1998). The comparative difficulty of subject and dative relative clauses in Korean. *Hawaii Linguistics Working Paper*.
- Mazuka, R. & B. Lust. (1990) On parameter setting and parsing: predictions for cross-linguistic differences in adult and child processing. In Lyn Frazier and Jill deVilliers (Eds.) *Language Processing and Language Acquisition*. Netherlands: Kluwer Academic Publishers. (pp. 163-205).
- O'Grady, W. (1998). *The Syntax Files*. Ms. Dept of Linguistics, University of Hawaii at Manoa.
- O'Grady, W., M.-S. Lee and M.-H. Choo. (2003). A subject-object asymmetry in the acquisition of relative clauses in Korean as a second language. *Studies on Second Language Acquisition* 25(3), 433-448.
- Oh, Y.-M. (2000). Teaching English Relative Clauses to Korean Learners. Scholarly paper for M.A. Dept. of Second Language Studies, University of Hawaii.
- Ortega, L. A.-O. (2000). Understanding syntactic complexity: The measurement of change in the syntax of instructed L2 Spanish learners. Unpublished doctoral dissertation, University of Hawaii at Manoa.
- Pavesi, M. (1986). Markedness, discorsal modes, and relative clause formation in a formal and an informal context. *Studies in Second Language Acquisition* 8, 38-55.
- Prideaux, G. & W. Baker. (1986). *Strategies and Structures: The Processing of Relative Clauses*. Philadelphia: John Benjamins.
- Schumann, J. H. (1980). The acquisition of English relative clauses by second language learners. In Scarcella, R. and Krashen, S.D. (eds.), *Research in Second Language Acquisition*. Rowley, MA: Newbury House. 118-31.
- Sheldon, A. (1974). The role of parallel function in the acquisition of relative clauses in English. *Journal of Verbal Learning and Verbal Behavior* 13, 272-81.
- Sheldon, A. (1976). The Acquisition of Relative clauses in French and English: Implications for Language learning universals. Paper presented at the Annual university of Wisconsin Linguistics Symposium (5th, Milwaukee, Wisconsin, March 1976).
- Sohn, H. (1999). *The Korean Language*. Cambridge: Cambridge University

Press.

- Wolfe-Quintero, K. (1992). Learnability and the acquisition of extraction in relative clauses and *wh*-questions. *Studies in Second Language Acquisition*, 14(1), 39-70.
- Wolfe-Quintero, K. (1998). Relative clause hierarchies and second language writing. Paper presented at the American Association for Applied Linguistics Colloquium: Research on Second Language Writing, Seattle, WA.

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