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Korean EFL Learners' Use of Complex RCs in a CMC Context *

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The researcher discussed second language (L2) English learners' motivation as well as their development of syntactic structures with special focus on the complex structures used in computer-mediated communication (CMC). A particular focus of the study is learners' use of English relative clauses (RCs). The researcher assumed that language complexity can be distributed based on L2 learners' particular RC preference. Eighteen Korean EFL learners participated in a set number of internet chat sessions with Japanese university students. A total of 62 tokens of natural RCs were found in the data set. The findings of the study showed that 1) the learners produced only subject and direct object RCs, and they produced the two RC types in almost equal number; 2) most of direct object RCs used by EFL learners in computer chatting had an inanimate head noun; and 3) the subject of direct object RCs involved mainly pronouns. Therefore, the researcher concluded that EFL learner's production of direct object RCs can reflect their strategies for planning their production pattern, which reduces the processing load of the parser. In addition, the present study's results are very similar to previous findings on English RCs in both corpus studies and experimental works.

[relative clauses/computer-mediated communication/language production/
관계절/컴퓨터 매개 의사소통/문장생성]

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I. INTRODUCTION

The present study examines Korean university students' use of English RCs in English language interaction via computer chatting. Communication in foreign language contexts is essential for EFL learners to increase their communicative ability; however, finding meaningful interactions with native English speakers is difficult for Korean EFL learners. Now that computer technologies have begun to be used in second language acquisition and learning contexts, learners' use of computer technologies for interaction with native speakers (NS) and even non-native speakers (NNS) has been welcomed in second language and foreign language learning and teaching (E. H. Hwang & N. Lee, 2014; L. Lee, 2005). Computer-mediated communication (CMC) encourages learners' use of computers for learning and even for teaching L2. In particular, the effects of CMC on language learning have been examined; for example, it is well known that meaning-focused negotiation can happen in L2 learning contexts via CMC (Chapelle, 1997; Y. H. Na & H. S. Kim, 2010). CMC is considered a tool for L2 development since learners can use it to engage in meaningful communication through interaction with native speakers or non-native speakers of English.

In particular, some studies that analyzed the grammatical forms produced by L2 learners have used CMC environments. Most of them conducted error analysis of learner's production in CMC contexts (Y. H. Na & H. S. Kim, 2010); furthermore, they have been largely conducted in asynchronous CMC environments. On the other hand, research on how grammatical forms are used in synchronous CMC is rare. Text-based synchronous CMC (e.g., computer chatting) offers L2 learners a natural setting for language production; therefore, learners can gain language learning experience along with high accuracy in terms of language form. Although some studies have shown that L2 learners have more time (or energy) to focus on form even in synchronous CMC settings (Abrams, 2003), to my limited knowledge, none of these studies have investigated how EFL learners use certain grammatically complex structures in fairly interactive settings. Therefore, this study examines how often EFL learners use one of the complex English structures (relative clauses in this case) and what structure types are employed in text-based NNS-NNS interactions conducted through synchronous CMC.

1. Language Learning in Synchronous CMC

Various studies have shown that the use of synchronous CMC promotes learners' target language learning (Sotillo, 2000; Warschauer & Kern, 2000). Text chatting, which is a form of synchronous CMC, comprises the characteristics of both spoken and written language. According to Kern (1995), EFL learners produced target language more actively in synchronous CMC contexts than in face-to-face interactions. This can be supported by the fact that interactive oral competence can be increased even through text-based CMC (Blake, 1998; Chun, 1994). Therefore, active participation in text chats offers learners an opportunity to improve both written and spoken skills.

While synchronous CMC can be used to offer learners meaningful interaction, asynchronous CMC is largely used to analyze learners' language form. Moreover, asynchronous CMC has been regarded as a tool for enhancing L2 learners' language form (Pellettieri, 2000; Sotillo, 2000). Florez-Estrada (1995) found that leaners learning Spanish through asynchronous CMC systems such as email exchange showed improvement in their grammatical competence. In particular, Pellettieri (2000) indicated that asynchronous CMC gives L2 learners a chance to develop their grammatical competence because they have sufficient time to plan their utterances while participating in CMC. This study found that the structure of the CMC plays a crucial role in L2 leaners' grammatical competence. However, synchronous CMC has been largely considered to encourage L2 learners' fluency, not accuracy in terms of grammar. Therefore, synchronous CMC can hardly be utilized as a useful means for developing L2 leaners' grammatical accuracy. Therefore, we may investigate the issue of whether it is truly unhelpful to use synchronous CMC to help L2 learners focus on language forms. It is well known that learners use relatively simple syntactic structures in CMC compared to traditional written communication because CMC has characteristics of both face-to-face interaction and written communication. However, research literature has strongly shown that different types of groups (face-to-face groups, synchronous CMC groups, and asynchronous CMC groups) indicated no big differences in terms of lexical choice and grammatical complexity (Abrams, 2003). Abrams' (2003) results showed that both the asynchronous CMC group and the synchronous CMC group did not show any significant differences in terms of their lexical and syntactic uses. Following with Abrams' findings, this study presupposes that synchronous CMC can provide natural linguistic data just like face-to-face interaction, where proper conversation in a target language is involved. Synchronous CMC can offer situations for authentic language use, which reflects EFL learner's true language competence; however, using synchronous CMC for analyzing grammatical structures has not yet been conducted in second language acquisition contexts.

2. Text Chatting in CMC

Text chatting gives learners an opportunity to continue conversation naturally in their own words, which can reflect their language skill. According to Swain's (2005) comprehensible output hypothesis, learner's output is important because through the production of language they can enhance their meaningful use of the target language (TL). In addition, O'Rourke (2008) claimed that output from synchronous CMC could be adequately used for language learning. As stated previously, because English

learning in synchronous CMC contexts has focused on communicative competence, few studies have focused on grammar use (D. H. Kang & E. D. Kim, 2004) in such contexts. D. H. Kang and E. D. Kim (2004) showed how synchronous CMC has an effect on L2 learners' grammar; however, the present study is not designed to prove that learners can learn grammar by participating in text-based chats, but to find how L2 learners use complex structures in real-time written interactions. If it is true that EFL learners need to use the target language structure for improving TL, CMC can give EFL learners an opportunity to increase their output of the TL, which is needed for them to promote their grammatical competence.

The present study selects a synchronous computer chatting context for data collection. Text chatting has many advantages. Text chatting through the computer can provide learners with interactive communication. It is difficult to record spontaneous speech from natural interactions among EFL learners. Moreover, text chatting is considered as a part of synchronous CMC because each learner is required to have online access in order to have a chatting session. One advantage of text chatting is that it allows learners to participate in the interaction by which a meaningful negotiation takes place. The key point of using synchronous CMCs is to promote learners' use of the target language (English). Naturally, this process will offer more meaningful interaction and negotiation of meaning (Pica & Doughty, 1985). Above all, results from interactions in the current study could provide researchers and educators with naturalistic data for understanding in detail the syntactic information of RCs produced by EFL learners.

Because language output through text chatting is recorded as a documented file, learners' language usage, which is reflected in text chatting interactions, can be thoroughly analyzed in the study.

Compared to previous studies on learners' use of RCs, which focused on learners' comprehensive and productive abilities, text chatting data does not restrict participants' choice with regard to the use of grammatical structure. In addition, since text chatting includes written interactions, there is no need to translate recorded data, which is a consideration in oral chatting. Previous studies on English RCs have used a variety of methodologies, which have proven that English subject RCs are easier to comprehend and produce than other types of RCs for L2 learners. However, none of these studies has researched the frequency and types of English relative clauses used by Korean EFL learners in spontaneous chatting contexts. Therefore, this study aims to examine the frequency and types of English relative clauses used by Korean EFL learners in a synchronous computer chatting context and to compare the results with those of previous works using different methodologies.

The aim of the study is to analyze the use of target language grammar in computer chatting by EFL learners. The reason for choosing English RCs is that RCs are one of the English language's complex structures because of their syntactic structure. Mastery of a certain complex syntactic structure can be used as a measurement of language competence (Chomsky, 1971). In addition, even if learners' production does not have a perfect form, their output may indicate their developing competence in TL grammar. If production patterns of English RCs in synchronous CMC indicate results similar to those of previous literature, it can be concluded that synchronous CMC data strongly supports some factors that affect the usage of RCs. This work will first review previous research on the use of English RCs by EFL learners. Furthermore, linguistic explanations of difficulty in producing a certain type of English RC will be proposed. After an overview of the previous research, the experimental study will be presented and discussed.

II. LITERATURE REVIEW

1. Studies on the Use of RCs by EFL Learners

English RCs have been an issue in various fields related to English language learning, such as first and second language acquisition and language processing. As shown in (1), English RCs involve (1) a relativizer (*who*), which can indicate the beginning of the embedded clause, and (2) a head noun that is modified by the following clause.

(1a) Subject RC: the man [who _sees the woman]
(1b) Direct object RC: the man [who the woman sees_]

Previous works on L2 learner RCs have strongly showed that subject RCs are easier to comprehend and produce than direct object RCs (e.g., Gass, 1979; C. E. Kim, 2016b, 2017b; M. S. Ko, 2007; H. M. Sung, 2014). L2 acquisition of English RCs by Korean EFL learners have been researched by various studies. Early studies, such as those conducted by Eckman, Bell, and Nelson (1988), Gass (1979), and Wolfe-Quintero (1992) used production tasks, in which the L2 learners were asked to produce a certain type of RC. O'Grady, M. S. Lee and M. H. Choo (2003) used a comprehension task to test how differently L2 learners comprehend two RCs (subject and direct object RCs). C. E. Kim (2016a, 2017b) used a self-paced reading task to see how L2 learners read different types of RCs (e.g., subject and indirect object RCs; oblique RCs with a relatively short filler-gap and oblique RCs with a relatively long filler-gap). Most of the studies can be used to support the Noun Phrase Accessibility Hierarchy (NPAH) proposed by Keenan and Comrie (1977). According to the NPAH, shown in (2), subjects are the most accessible to learners, followed by direct objects.

(2) NPAH:
subject > direct object > indirect object > oblique > genitive

Keenan and Comrie's claim is that the difficulty of accessing noun phrases during production, comprehension,

and sentence processing varies depending on grammatical role for both L1 and L2 speakers. In the Korean EFL context, M. S. Ko (2007) suggested that high school EFL Korean students showed lower accuracy rates on direct object RCs than on subject RCs in English essay writing.

Thus, subject RCs are the easiest type for learners to access. Simply put, subject and direct object RCs have exactly the same number of words and identical lexical items; however, as shown in (3), one is more difficult to process than the other. Among the many approaches to the difficulty of direct object RCs, in particular, Gibson (1998) and O'Grady (2015) pointed out that English direct object RCs, as in (3b), are more difficult to process than subject RCs, as shown in (3a).

(3a) Subject RC:
the reporter [that _ attacked the senator]
|_____0___|

(3b) Direct object RC:
the reporter [that the senator attacked _]
|_____1_____2_____|

The greater length of the filler-gap dependency in direct object RCs compared to subject RCs as exemplified in (3) causes processing difficulty in both comprehension and production. Gibson (1998, 2000) described a "distance effect" to explain the difficulty of the direct object RC by adopting the Dependency Locality Theory. His idea clarifies that the difficulty of a certain type of RC (e.g., direct object) results from the dependencies between the lexical items, which are connected by the integration process. In other words, the direct object RCs require more effort to connect the filler and the gap position; thus, direct object RCs have more discourse materials compared to subject RCs. Example (3) provides more discourse referents between the filler and the gap position for the direct object RCs (e.g, *senator, attack*) than for the subject RCs (nothing). Here the discourse referents only refer to V or N which introduce new events and entities. When the direct object RCs take new discourse materials that have intervened between the filler and the gap, resolving the filler-gap dependency creates a burden on working memory. O'Grady (2015) explains that this distance factor creates the difficulty of processing a RC and the difficulty increases as the length between the filler and the gap increases. Processors require more time to connect the filler with the gap in direct object RCs than in subject RCs. The "distance effect" has been the focus of research in various fields (L1 acquisition: C. E. Kim & O'Grady, 2016; L2 processing: C. E. Kim, 2016a, 2017b) and the results of these studies completely support the NPAH. In particular, C. E. Kim (2017b) indicated that L2 learners have difficulty comprehending English direct object RCs because of their syntactic complexity. Thus, direct object RCs are more complex to process because the longer distance between the filler and the gap creates a greater processing burden.

2. Animacy Issue

Recent research using experimental methods has found that adult L2 learners prefer a certain RC to other types of RC (C. E. Kim, 2016a, 2017b). Many researchers have pointed out that the head nouns in both subject and direct object RCs used in previous experimental works were animate as in (4) (Gennari & MacDonald, 2008; Reali & Christiansen, 2007; Traxler, Morris, & Seely, 2002). Regarding processing English RCs, animacy of the head noun in the RCs is another important issue other than the distance between the filler and the gap.

(4a) Subject RC:
the director [that _ praised the musician]

(4b) Direct object RC:
the musician [that the director praised _]

Kidd, Brandt, Lieven, and Tomasello (2007) analyzed two corpora studies and conducted two experimental studies, in which they showed that English- and German-speaking kids produced direct object RCs more often when they had (1) an inanimate head noun and (2) a pronominal relative clause subject. Their study also suggested that children made direct object RCs in naturalistic speech; therefore, subject-direct object asymmetry in producing RCs disappeared. In addition, Zubin (1979) conducted a German L1 corpus study and found that direct RCs with inanimate head noun and animate subject as shown in (5b) were frequently used; however, direct RCs with animate head noun and inanimate subject as in (5a) were very rare. Researching RCs in children's spontaneous speech, Diessel and Tomasello (2005) also showed that children produced direct object RCs with inanimate head nouns in both German and English.

(5a) the boy that the stone hit

(5b) the stone that the boy threw

C. E. Kim (2017a) tested L2 learners on subject and indirect object RCs in order to get rid of the animacy influence in processing English RCs. Although L1 corpus data from adults and children have supported the effect of head noun animacy in processing the direct object RCs, not many studies using spontaneous data have been conducted to observe animacy influence in EFL learner's production of RCs.

3. Givenness Hierarchy

According to the Givenness Hierarchy proposed by Gundel, Hedberg, and Zacharski (1993), a correlation can be observed between referring expressions and the speakers' cognitive status, such as givenness, topic, and presupposition. The hierarchy is described in (6).

(6) it < this, that < that N < the N < a N
Central Peripheral

They suggested that natural languages with determiners and pronouns could be encoded with information for cognitive accessibility, which has an effect on the processor's mind. For examples, in *The boy gave a book to me*, the definite article the encodes the information that addresses the need to retrieve a representation from the memory. However, pronouns located at a lower position in the hierarchy can encode information about the assumed cognitive status because pronouns provide a familiarity interpretation, which is associated with the conceptual content encoded by the form. Warren and Gibson (2002) used self-paced reading experiments, providing that referential accessibility imposes graded processing.

(7a) the student who the professor who **I** collaborated with had advised copied the article.

(7b) the student who the professor who **the scientist** collaborated with had advised copied the article.

In particular, their findings suggest that the embedded subject in direct object RCs is closely connected with their difficulty. Thus, sentences with first and second person pronouns in the subject position in direct object RCs as in (7a) are less complex to process than sentences with NPs as in (7b), which is located in the right position in the hierarchy. Moreover, as discussed in the previous sections, Kidd et al. indicated that English-speaking kids produce direct object RCs when they have a pronominal RC subject. Therefore, discourse processing has an effect on sentence processing, suggesting that the demands of referential processing play an important role in syntactic processing.

In this study, the researcher aimed to address the following research questions:

1) What types of English RCs do Korean EFL learners use in synchronous computer chat sessions?
2) What kinds of head nouns in terms of animacy do Korean EFL learners use in direct object RCs?
3) What kinds of noun types do Korean EFL learners use in the subject position in direct object RCs?

III. THE STUDY

As discussed in previous sections, based on the previous findings that grammar gains of L2 learners in synchronous CMC contexts are similar to those gained in natural interactions, we can assume that data from text chatting can provide reliable information about participants' grammar use.

1. Data Collection

The data was collected from text chatting sessions conducted as part of the Korea Waseda Cross-Cultural Distance Learning Program (CCDL). This program was started in 1999, and it provides EFL students at Korea University and Waseda University with opportunities for language learning through interaction via text chatting and other tools (video conferencing, voice chat, electronic bulletin board, and so on). All subjects of this study were native speakers of Korean, with a mean age of 23 (range: 21-25) and took an "English Grammar" course offered by the department of English language and literature at Korea University. As a class activity, the students participated in the CCDL project outside of class time during the 2015 fall semester. The students were required to participate in text chatting sessions, which were conducted outside of the classroom. Students were required to come to the multi-media room, where chatting sessions were conducted at a time designated by them. The sessions began with students sitting in front of the computer and logging onto the website for online chatting (https://cnavi.waseda.jp). Each student was given their own chatting ID and password, which could be used for one semester. Three to four students from each university were formed into a group; however, one group had a total six to eight students. Each session lasted no longer than one hour, and students were able to save the complete chat data as a documented file to use in a final reflection paper. In one semester, students were asked to complete at least six sessions, which consisted of different discussion topics. Six topics were given to the students before starting each chatting session. These topics were as follows: (1) self-introduction, (2) the meaning of their names, (3) (dis)advantages of social networking sites (SNS) (4) becoming fluent EFL speakers, (5) using double negation, and (6) what makes their university a top-100 university. After all the chat sessions ended, students printed out their chatting data and handed it over to the instructor. Eighteen students' chatting data were randomly selected to investigate their production of English RCs. These students were native speakers of Korean, and they carried out 108 chat sessions, which were the target of analysis.

2. Data Analysis

Because we are not concerned with EFL leaners' interactions, the study examines only the 18 Korean EFL learners' production. First, all RC tokens in the data set were counted. The researcher performed the token selection and double-checked the data. Second, selected tokens were analyzed based on the types of English RCs (subject RCs and object RCs) used. Lastly, after identification of RC type, (1) animacy of the head noun, and (2) NPs in embedded subject position were examined to investigate the properties of English RCs produced in synchronous CMC settings.

IV. RESULTS AND DISCUSSION

This paper reports three different analyses that examined whether the properties of the RCs produced by EFL learners had an effect on the production of RCs. The first analysis established the types of RCs produced. The RCs were then labeled according to structural type and ordered in terms of frequency. The second analysis examined the animacy of the head nouns in direct object RCs. The last analysis investigated the properties of NPs in embedded subject position, which are important for processing direct object RCs.

1. Types of RCs

To answer the first research question, all chatting data was analyzed. 18 students produced 5,874 sentences in total (56 sentences per each session). No ungrammatical use of an RC was found. As a result, two among the 18 participants produced no RCs. Sixteen out of eighteen participants produced sixty-two subject and direct object RCs in total, as shown in Table 1. No participant produced any other type of RC. In this study, the statistical difference is not an issue; therefore, the percentage of each RC is presented.

TABLE 1
Frequency of English RCs

Type of RC	*N*	Percentage
Subject	30	48.38%
Direct object	32	51.61%
Total	62	100%

EFL learners in the current research study produced both subject and direct object RCs in almost equal numbers (30 for subject RC and 32 for direct object RC). Their performance on both subject and direct object RCs was good. They achieved perfect accuracy for both types because all the RCs produced did not have any ungrammatical forms.

Examples of subject and direct object RCs extracted from the data are shown in (8).

(8a) Example of Subject RC
In Korea, fluent speaker of English who comes to mind at first is Kimoon Ban. (Participant 16)
(8b) Example of Direct object RC
…and the others also are about the features of English that we use. (Participant 9)

The results of this study confirm those of previous studies in that the learners produced subject and direct object RCs, which are higher on the NPAH. No indirect object, oblique, or genitive RCs, which are lower on the NPAH, were produced. However, interestingly, the participants did not avoid employing direct object RCs in synchronous interaction via the computer. This contradicts the claim that the syntactic complexity of direct object RCs leads learners to use them less often than subject RCs. In the following sections, we will examine the questions of why Korean EFL learners produce direct object RCs more often compared to the results of previous research and what kinds of direct object RCs EFL learners produce.

2. Animacy of Head Noun

To examine the effects of head noun animacy in the RC, the patterns of head nouns in Table 2 show the percentage of animate and inanimate head nouns in the direct object RCs.

TABLE 2
Animacy of Head Nouns in Direct Object RCs

Animacy of head nouns	*N*	Percentage
Animate	4	12%
Inanimate	28	88%
Total	32	100%

The participants making direct object RCs mostly produced direct object RCs with inanimate head nouns as shown in (9).

(9a) according to **information** we have, the ranking of Waseda university…(Participant 4)
(9b) There are **some places** that every foreigner visits when they come to Korea. (Participant 5)
(9c) What's your thought about **the photos** we upload on SNS? (Participant 6)

Among 32 direct object RCs, 88% of the sentences including direct object RCs contained inanimate head nouns, such as *information, some places, and the photos.*

Interestingly, all 30 subject RCs had only animate head nouns, as shown in example (10).

(10) Example of Subject RC
In Korea, fluent speaker of English who comes to mind at first is Kimoon Ban. (Participant 16)

The results of analysis of the animacy of head nouns in two RCs clearly demonstrated the distinctive preference for animacy. The fact that the participants did not avoid direct object RCs but employed inanimate head nouns in direct object RCs is a strong indicator that the vast majority of direct object RCs in actual speech take inanimate head nouns. This finding has also been attested by the findings of previous works. Therefore, it seems that the participants in the study produced more direct object RCs with inanimate heads, and it helped to minimize the difficulty of direct object RCs with longer filler-gap dependencies.

3. Pronominal RC Subject

As an additional analysis, the NP types of the embedded subject position were analyzed as indicated in Table 3.

TABLE 3
NP Type in Embedded Subject Position

NP Types	*N*	Percentage
Pronoun	26	81%
NP	6	19%
Total	32	100%

Among 32 direct object RCs, 81% in the data set used personal pronouns as the subject in the embedded clause. Two types of NP as the embedded subject, first singular and first plural pronouns (e.g., I and *we*), were most frequently used, as shown in (10).

(10a)…and the others also are about the features of English that **we** use. (Participant 9)
(10b)There are lots of things **we** should try hard to improve and fix, I guess. (Participant 6)

Embedded subject position took the pronoun we, as shown in example (9), which is consistent with Warren and Gibson's results, which indicate that pronouns weaken the processing burden. While these pronouns referred to default referents, definite descriptions (e.g., *the* N) introduced referents (Warren & Gibson, 2002). Because the first person pronoun in the subject position does not require the participants to build a new discourse referent, which imposes an additional processing cost, use of the first person nouns is preferred.

The experiment presented in this paper provides the type and the frequency of the English RCs produced by EFL leaners in synchronous computer chatting contexts and supports and extends the evidence for the animacy influence on direct object RC processing, which is considered as a complex structure. In addition, it supports the Givenness Hierarchy, a theory about the effects of the resource demands of discourse processing. In this section, I discuss each of these results in turn.

First, in 108 chat sessions, the EFL learners employed only subject and direct object RCs, and they employed these two types at very similar rates. None of the other types of RCs such as indirect object RCs and oblique RCs was produced by the EFL learners. These findings are somewhat consistent with Keenan and Comrie's hypothesis, which suggests that subject and direct object RCs are more accessible than other types of RCs; however, the findings contradicts results from previous experimental L2 research, which showed asymmetry in subject and direct object processing (comprehension: O'Grady et al., 2003; production: C. E. Kim, 2017a). In particular, C. E. Kim (2017a) used an elicited-production task to investigate how differently L2 learners produce subject and direct object. She found both native speakers of the English group and the L2 leaners group used more alternative responses (e.g., passive RCs) when direct object RCs were elicited. However, they responded to subject RC items with targeted items. Therefore, the results of the present study strongly support the idea that other factors, such as animacy and the NP types of the subjects in direct object RCs, can affect learners' production of English RCs.

Second, this study's findings regarding head noun animacy influence support many previous studies' findings on the effect of head noun on processing RCs in different languages (mainly English and German). In addition, taking inanimate head nouns in direct object RCs can weaken the processing burden. As a result, direct object RCs are easier to comprehend and produce when they take the inanimate head nouns (C. E. Kim, 2017a, see more references cited therein). Our findings that EFL learners presented direct object RCs with inanimate head nouns in chatting sessions extends the assumption that direct object RCs in actual speech take inanimate head nouns. To my knowledge, none of the previous studies showed natural linguistic data where EFL learners produced direct object RCs. Thus, English direct object RCs can be easily produced when L2 learners plan to take inanimate head nouns for constructing direct object RCs. This finding strongly supports the previous findings that indicated direct object RCs are easier to process when they have inanimate head nouns.

Third, the results of analyzing the NP types in subject position suggest that there is a strong connection between a referent for an NP and the processing cost of the direct object RC. I and we were found to be the most common subjects in direct object RCs, which is consistent with earlier research (e.g., Warren & Gibson, 2002). Furthermore, the findings demonstrate that the types of an NP are dependent on the processing cost of the direct object RCs. The referential processing is correlated with processing costs, so the EFL leaners take first personal pronouns often, a practice which is less burdensome in the production of direct object RCs. Therefore, it can be concluded that English direct object RCs are easier to process if L2 learners use highly accessible referential expressions such as pronouns (e.g., *I* and *we*) rather than less accessible referential expressions (e.g., '*the/a* + N'). Such referential accessibility may explain why the direct object RCs produced by the EFL learners in this study tended to include pronouns.

V. CONCLUSION

This study examined 18 Korean university students' use of RCs in English-language computer chat interactions. Through analysis of the direct object RCs, we can conclude that EFL learners did not avoid direct object RCs; rather, they produced direct object RCs by practicing certain strategies: (1) using inanimate head nouns and (2) using first pronominal RC subjects. As interaction in CMC contexts, where natural interaction between NNS-NNS

can occur, does not restrict learners' structure choice, the current study offers naturalistic and reliable data. Challenging the results of previous experimental studies, in which production of direct object RCs has been examined with regard to the distance between the filler and gap, the present study indicates various factors should be considered to determine the difficulty in producing direct object RCs. The results of the study support Kidd et al.'s L1 findings from corpora and experimental studies. Therefore, this study can contribute to SLA literature by proving that EFL learners produce direct object RCs more often with (1) an inanimate head noun and (2) a pronominal relative clause subject.

In the EFL teaching context, an EFL teacher is required to understand both the form and function of English RC construction with regard to types of RCs (see Celce-Murcia & Larsen-Freeman, 1999). Students should be aware of the differences in syntactic patterns between their first and target languages. More importantly, knowledge of multiple factors, such as animacy of head noun and a pronominal RC subject, can influence the learning of direct object RCs in English, which is crucial in mastery of TL.

However, the present study has several limitations. First, given the possibility that L2 learners' direct object RC production can be influenced by their language proficiency, further research needs to be conducted to see how L2 learners' proficiency effects their RC production. Second, a future study should be conducted to find data through synchronous CMC between NS and NS, to compare the various production patterns that happen in L1 and L2 interactions. However, it is practically impossible to find synchronous CMC settings that are exactly like the ones used in the present study, to check NS-NS interaction. Therefore, first, proper L2 corpus data should be selected. After this step, the findings of the present study can be considered in conducting the study.

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