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Resetting parameters in Chinese speakers' acquisition of Korean wh-phrase with [±Q] feature*

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Park, Sun Hee, Jin Jeong, and Hyunwoo Kim. 2021. Resetting parameters in Chinese speakers' acquisition of Korean wh-phrase with [±Q] feature. *Linguistic Research* 38(Special Edition): 53-75. This study investigated whether Chinese speakers can acquire features associated with the embedded *wh*-phrase in Korean. Researchers have made different predictions regarding L2 parameter resetting. Some approaches claim that L1 parameter values can be successfully reset to L2-specific values, whereas others predict consistent difficulty in L2 parameter resetting. Our analyses of an acceptability judgment task showed that despite the lack of relevant information in their L1, Chinese-speaking learners of Korean had target-like knowledge of the morphological constraints associated with the features that license *wh*-phrases in Korean embedded clauses. We also found that learner performance was modulated by their Korean proficiency. These findings align with the view that parameter resetting is possible in L2 acquisition insofar as L2 proficiency is sufficiently high. **(Ewha Womans University · The University of Hong Kong · Yonsei University)**

Keywords parameter resetting, Korean *wh*-phrase, Chinese speakers, acceptability judgment

1. Introduction

Researchers in the field of second language acquisition (SLA) have devoted a great deal of attention to the issue of second language (L2) learner's interlanguage grammar, with a particular focus on how L2 grammars develop over time (White 2003). Traditionally, one of the main concerns within the generative framework of SLA has been how successfully L2 learners can acquire new morphosyntactic features that are instantiated differently than in their L1s (e.g. Hawkins and Hattori 2006; Haznedar and Schwartz 1997; Lardiere 1998; White et al. 2004). Researchers have provided different accounts on whether L2 learners reach ultimate attainment of abstract functional features

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in target languages. For instance, the No Parameter Resetting Hypothesis predicts persistent variability in the L2 acquisition of functional features (Hawkins and Chan 1997). This hypothesis claims that full parameter resetting in L2 grammars is impossible due to a lack of morphosyntactic representations in the learners' interlanguage grammar. In contrast, Full parameter resetting approaches such as the Full Transfer Full Access Hypothesis maintain that parameter values obtained in the L1 that shape the initial state of learners' L2 grammar can be fully reset to values appropriate to the L2 over the course of L2 acquisition (Schwartz and Sprouse 1994, 1996, 2000). Lardiere (2008, 2009) proposed the Feature Reassembly Hypothesis, according to which L2 learners may have difficulty with detecting and reassembling features that are instantiated differently across learners' L1s and L2s.

The issue of parameter resetting in SLA has been studied extensively. In particular, numerous studies have investigated the L2 acquisition of question sentences: some have explored whether L2 learners with *wh*-situ language backgrounds can fully acquire the abstract features relevant to *wh*-movement in target languages that instantiate overt *wh*-movements (e.g. Johnson and Newport 1991; Epstein et al. 1996; Hawkins and Chan 1997; White and Juffs 1998; Kim 2003; Hawkins and Hattori 2006); meanwhile, others have investigated whether speakers of overt *wh*-movement languages can acquire syntactic features associated with covert movement operations in question sentences in *wh*-situ languages (e.g. Kim 2003; Choi 2009). These previous studies have produced inconsistent findings regarding successful parameter resetting in an L2, depending on learners' L1 backgrounds, proficiency levels, and the target structures investigated. In this study, we aimed to contribute to the ongoing debate about L2 parameter resetting by investigating L2 acquisition of the *wh*-phrase *mwuet* "what" in Korean by L1 Chinese speakers. Instead of examining the acquisition of movement features, we set out to expand the scope of previous investigations on L2 parameter resetting by focusing on a rather understudied issue—whether speakers of a language lacking a morphological marking system (e.g. Chinese) can learn morphosyntactic constraints in question sentences in a target language (e.g. Korean).

As will be explained in the next section, some Korean verbs can entail only particular types of morphemes as licensors of embedded question clauses. As shown in (1), when the verb *kwungkumha* "wonder" takes an embedded question clause, the question marker *nunci* must license the embedded clause.

(1) Na-nun Ne-ka mwues-ul pwass-nunci kwungkumha-ta.
I-Top you-Nom what-Acc saw-Q wonder-Dec[1]
"I wonder what you saw."

For L2 learners whose L1 lacks such morphosyntactic markings like Chinese, it is crucial to reset the parameters associated with the licensors of embedded questions from the L1 values [-morpheme] to the values appropriate to the target language [+morpheme], since the wrong choice of marker for an embedded clause makes a sentence ungrammatical. To evaluate Chinese-speaking L2 learners' knowledge of morphosyntactic constraints in Korean question sentences, we conducted an acceptability judgment task involving Korean sentences in which we manipulated the morphological types of an embedded question clause (i.e. question or declarative marker) in a declarative or question sentence. In this way, we tested different hypothesis regarding L2 parameter resetting.

2. Approaches to parameter resetting in SLA

Within the generative linguistic framework of SLA, researchers have long debated whether L2 learners can acquire formal features instantiated exclusively in the target language (Bley-Vroman 1990; Cook and Newson 1996; Epstein et al. 1996; Schwartz and Sprouse 1996; see White 2003, for review). Among several issues related to the characteristics and development of interlanguage grammar (or grammar of L2 learners), the topic of *parameter resetting* has attracted a huge amount of attention. Generative approaches claim that interlanguage grammars are mainly constrained by two components: principles—invariant linguistic properties that exist universally across languages; and parameters—a set of values specific to each language. While L2 learners are assumed to have knowledge of constraints associated with universal principles, they must newly acquire each set of language-specific parameter values, particularly when target parameter values differ between learners' L1 and L2 (Haegeman 1988). Several accounts have been proposed to characterize how L2 learners restructure their grammar by resetting parameters in the course of developing grammar knowledge over time. In this section,

1 The glosses used throughout this paper are as follows: Acc = Accusative marker, Comp = Complementizer, Dec = Declarative marker, Loc = Locative marker; Nom = Nominative marker, Q = Question marker, Top = Topic marker

we review three main approaches based on diverging perspectives regarding whether L2 learners can acquire L2-specific formal features that are unavailable in their L1s.

The first approach posits that there is a breakdown in interlanguage grammar, and L2 learners cannot acquire new formal features in a target language. This approach, formalized in the No Parameter Resetting Hypothesis (NPRH, Hawkins 1998; Hawkins and Chan 1997), maintains that grammatical representations in interlanguage grammar are globally defective, making it difficult for L2 learners to acquire and utilize L2-specific parameters. On this account, since L2 learners cannot access fully-specified grammatical information in a target language, they rely instead on their L1 grammar to comprehend and produce target structures. Some key evidence supporting the NPRH comes from studies showing that L2 learners consistently struggle with the acquisition of grammatical features that are not available in their L1s. For example, researchers have observed problems in the production of English articles by L2 learners from languages without an article system (e.g. Luk and Shirai 2009), in the use of morphosyntactic information associated with gender agreement between determiners and nouns in French by English speakers (Hawkins 1998), and in the interpretation of multiple *wh*-questions in English by Japanese speakers whose L1 lacks an overt *wh*-movement (Hawkins and Hattori 2006).

In contrast to the NPRH, the Full Transfer Full Access Hypothesis (FTFA, Schwartz and Sprouse 1994, 1996, 2000) claims that the initial state of learners' interlanguage grammar is shaped by their L1, and learners can acquire target features by gradually resetting parameters from their L1 to the L2. This approach assumes that a divergence between L2 interlanguage grammar and the target language grammar may arise, mainly due to mapping errors between morphological forms and learners' morphosyntactic knowledge, rather than because of representational deficits in L2 grammars. Despite some divergent behaviors in L2 learners using target languages, the FTFA argues that the same components that characterize L1 grammar systems constrain L2 acquisition of grammatical elements, enabling learners to ultimately readjust their interlanguage grammar to the parameter values appropriate to the L2. Studies supporting the FTFA demonstrate that advanced L2 learners can acquire full knowledge of target language features, albeit not instantiated in their L1 (e.g. Epstein et al. 1996; Inagaki 2001; Montrul 2000).

Unlike the NPRH and the FTFA, which are mainly concerned with parameter resetting of L2-specific features, Lardiere (2008, 2009) focused on cases in which the

target features are instantiated differently from learners' L1s. For example, Korean and Chinese both allow for an embedded *wh*-question either in a question or a declarative sentence. However, functional features that license embedded *wh*-questions are realized differently across these languages. The embedded *wh*-question in Korean is licensed by an overt complementizer, whereas its Chinese counterpart is licensed by a covert feature. Therefore, when Chinese speakers learn embedded *wh*-questions in Korean, they need to reassemble the relevant features, in this case, from a null morpheme feature to an overt morpheme feature. Lardiere claimed that such parameter reassembly presents major challenges to L2 learners, proposing the Feature Reassembly Hypothesis (FRH). Studies supporting the FRH have shown that L2 learners have particular difficulties when required to reassemble the target features that conflict with features in their L1 (e.g. Dekydtspotter and Renaud 2009).

In summary, the three hypotheses outlined so far make different predictions regarding L2 parameter resetting. The NPRH predicts that L2 learners will be unable to acquire target features not instantiated in their L1, due to representational deficits in the interlanguage grammar. The FTFA predicts that a successful parameter resetting is possible, although non-target-like performance may sometimes be found among learners due to mapping errors between learners' grammatical knowledge and morphosyntactic forms in the target language. Finally, the FRH predicts that problems in parameter resetting will occur when a feature clash exists between learners' L1 and L2.

3. Embedded wh-questions in Chinese and Korean

Although Chinese and Korean are *wh*-in-situ languages and therefore share the same parameter information in terms of *wh*-movement, the two languages diverge most significantly in the types of features that license *wh*-phrases in embedded clauses. In Korean, the embedded *wh*-phrase must be licensed by the overt Q marker *-nunci*. As in (2a), for example, in order for the question-selecting verb *kwungkumha* "wonder" to take the interrogative clause as a complement, the clause must be licensed by a morpheme that contains the [+Q] feature, in this case *-nunci*.[2] When the embedded *wh*-question in

2 The matrix verbs are classified into two categories depending on the semantic features of the complements that the verbs require. Proposition-selecting predicates (P-predicates) require propositions as complements, whereas question-selecting predicates (Q-predicates) require questions as complements (Adger and Quer

Korean is modified by the complementizer *-ko*,[3] as in (2b), the sentence becomes ungrammatical, since the complementizer bears the [-Q] feature and, as a result, cannot license the interrogative complement. The complementizer is instead fully acceptable when a declarative clause is followed by a proposition-selecting predicate such as *sayngkakha* "think," as in (2c).

(2) a. Na-nun John-i mwues-ul sass-nunci kwungkumha-ta.
I-Top John-Nom what-Acc bought-Q wonder-Dec
"I wonder what John bought."
b. *Na-nun John-i mwues-ul sass-ta-ko kwungkumha-ta.
I-Top John-Nom what-Acc bought-Dec-Comp wonder-Dec
"I wonder that what John bought."
c. Na-nun John-i kwail-ul sass-ta-ko sayngkakha-nta.
I-Top John-Nom fruit-Acc bought-Dec-Comp think-Dec
"I think that John bought fruits."

Unlike in Korean, the Chinese *wh*-phrase does not require any overt morphological licenser for embedded clauses. Instead, a covert [+Q] feature licenses the interrogative clause, and the *wh*-phrase *shenme* "what" receives a *wh*-question reading when followed by the question-selecting verb *xiangzhidao* "wonder," as in (3) (Webelhuth 1995).

(3) Wo xiangzhidao John mai le shenme.
I wonder John bought what
"I wonder what John bought."

The cross-linguistic difference in terms of the type of licenser for an embedded *wh*-question between Korean and Chinese allows us to test whether Chinese-speaking learners of Korean can successfully reset the L1-specific parameter [-morpheme] and acquire the [+morpheme] parameter in Korean embedded *wh*-questions. If learners have

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2001). While verbs such as *know* and *think* belong to the P-predicate type, verbs such as *wonder* (also, the Korean verb *kwungkumha* and the Chinese verb *xiangzhidao*), belong to the Q-predicates (Chomsky 1965; Huang 1982, 1995). Apart from the verb *kwungkumha* "wonder", the verb *molu* "do not know" also can be licensed by a [+Q] morpheme *–nunci* in Korean (J.-B.Kim 2017; Kim et al. 2021).

3 The conjunctive morpheme *–ko* may appear in coordinate constructions in Korean (Park and Kim 2021).

problems with the parameter resetting and do not properly differentiate the Q marker *-nunci* in (2a) and the declarative complementizer *-ko* in (2b), they will fail to reject the ungrammatical sentence (2b). Otherwise, if learners overcome the cross-linguistic difference and successfully reset the parameters, they will reject the ungrammatical sentence (2b) while accepting (2a).

In the following section, we report results of an acceptability judgment task designed to test these predictions. During the task, Chinese speakers were asked to judge the acceptability of Korean sentences involving embedded interrogative clauses paired with different types of embedded-clause licensers, as illustrated in (2a) and (2b). By assessing Chinese speakers' grammatical knowledge of the morphological constraints of embedded *wh*-questions in Korean, we tested the validity of the three hypotheses discussed in the previous section. The NPRH assumes no successful parameter resetting in L2 acquisition, and thus predicts that Chinese speakers will not make grammatical distinctions between (2a) and (2b). Likewise, the FRH, which assumes L2 learners' difficulties of acquiring target features that conflict with features in their L1, expects that Chinese speakers will have difficulty rejecting (2b). In contrast to the NPRH and the FRH, the FTFA predicts that Chinese speakers will be able to fully reset parameters and can make grammatical distinction between (2a) and (2b).

4. Methods

4.1 Participants

A total of 60 Chinese-speaking adult learners of Korean (NNS, mean age = 24.6) with advanced Korean proficiency completed an acceptability judgment task. They were recruited from international or exchange graduate students at a local university in Korea. Results of a language background questionnaire showed that these participants were first exposed to Korean at a mean age of 21.8, and most had spent 2 years in Korea (mean length of stay = 2.2 years) at the time of testing. We estimated L2 participants' Korean proficiency using a modified version of the TOPIK (Test of Proficiency in Korean) (e.g. Jeong 2017; Park and Kim 2018). The task included 20 multiple-choice items that assessed vocabulary and grammatical knowledge in Korean. We converted participants' scores on this task to standardized scores that ranged from 10 to 44 (out of 60), with

a mean score of 28 (SD = 8.9). In addition to the NNS group, 30 adult Korean speakers (NS, mean age = 29.2) served as a control group. All participants received the Korean equivalent of $9 for their participation.

4.2 Materials

We constructed stimuli for the acceptability judgment task including 24 sentences aligned in a 2 × 2 Latin Square design, manipulating the markers that determine the embedded clause type (Q-marker vs. declarative complementizer) and the types of sentences (declarative vs. question), as shown in (4). We varied the sentence type in addition to the embedded-clause markers to ensure that any evidence that Chinese speakers distinguish between the Q-marker and the declarative complementizer could be attributed to their parameter resetting, not to the influence of the specific sentence type.

(4) a. Q-marker + Declarative sentence (QM_Dec)
Na-nun Mary-ka kakey-eyse mwues-ul sass-nunci kwungkumha-ta.
I-Top Mary-Nom shop-Loc what-Acc bought-Q wonder-Dec
"I wonder what Mary bought in the shop."

b. Q-marker + Question sentence (QM_Q)
Ne-nun Mary-ka kakey-eyse mwues-ul sass-nunci kwungkumha-ni?
You-Top Mary-Nom shop-Loc what-Acc bought-Q wonder-Q
"Do you wonder what Mary bought in the shop?"

c. Declarative complementizer + Declarative sentence (DeCOMP_Dec)
*Na-nun Mary-ka kakey-eyse mwues-ul sass-ta-ko
I-Top Mary-Nom shop-Loc what-Acc bought-Dec-Comp
kwungkumha-ta.
wonder-Dec
"I wonder that what Mary bought in the shop."

d. Declarative complementizer + Question sentence (DeCOMP_Q)
*Ne-nun Mary-ka kakey-eyse mwues-ul sass-ta-ko
You-Top Mary-Nom shop-Loc what-Acc bought-Dec-Comp
kwungkumha-ni?
wonder-Q

"Do you wonder that what Mary bought in the shop?"

For the matrix verb in the experimental sentences, we consistently used the question-selecting verb *kwungkumha* "wonder", which requires an interrogative embedded clause as a complement. In the interrogative embedded clause conditions (4a, 4b), the question marker (QM) *-nunci* appeared as a licenser for the embedded clause, creating an indirect question for the sentence. In the non-interrogative embedded clause conditions (4c, 4d), the question marker was replaced with the declarative complementizer (DeCOMP) *-ko*. For a natural reading of each sentence type, we used the first-person pronoun *na* "I" as the matrix subject in the Dec conditions (4a, 4c) and the second-person pronoun *ne* "you" in the Q conditions (4b, 4d). Note that for the question-selecting predicate *kwungkumha* "wonder," the declarative complementizer *-ko* cannot license an interrogative embedded clause, rendering sentences (4c) and (4d) ungrammatical. In contrast, sentences (4a) and (4b) are acceptable since the QM *-nunci* can license an interrogative embedded clause. This grammaticality of the licenser for the embedded clause remains stable, irrespective of whether a sentence is declarative (Dec) or a question (Q).

Four lists were created with six tokens of sentences in each condition. Participants were randomly assigned to one of the four lists so that they encountered only one condition of a single item. We intermixed the experimental items with 38 fillers consisting of sentences involving various types of verbs (motion verbs, transitive verbs, etc.). To ensure lexical familiarity for the L2 participants, we selected all the lexical items in the experimental and filler sentences among those that appear in the vocabulary lists for beginner to intermediate learners of Korean provided by the International Standard Curriculum of Korean Language (Kim et al. 2011).

4.3 Procedure

During a single visit to a lab, participants individually completed the language background questionnaire and the acceptability judgment task via a web-based interface. L2 participants also completed the Korean proficiency test. During the acceptability judgment task, participants were presented with Korean sentences on a computer screen, one item per page, and asked to rate the naturalness of the sentences on a scale from

1 (most unnatural) to 4 (most natural). They were also told to choose the option "I don't know" when they were unsure of the answer. Prior to the experiment, participants worked through two practice items. The entire task took approximately 30 minutes.

5. Results

5.1 Data trimming and analysis method

We first screened participants' responses in the acceptability judgment task for selection of the "I don't know" option. Such responses constituted 0.5% of all collected data (0.3% in the NS, 0.7% in the NNS) and were removed from subsequent analyses.

For data analysis, we used a linear mixed effects regression (Baayen 2008) that included group (NS, NNS), embedded clause marker (QM, DeCOMP), and sentence type (Q, Dec) as fixed factors, along with the random effects of participant and item. All fixed effects were contrast-coded and centered. Following Barr, Levy, Scheepers and Tily (2013), the model included the maximal random effects structure allowed by the design. To assess the interacting role of proficiency, we created a separate model for the subset of data that included only the NNS group, and then added TOPIK scores as an additional factor. All modeling was carried out using R (R Development Core Team 2017) and the lme4 package.

5.2 Results of the NS and NNS data

Table 1 presents the descriptive statistics for participants' responses regarding the experimental sentences, and Figure 1 provides a graphical illustration of these statistics. The NS group generally accepted the well-formed QM conditions while rejecting the ill-formed DeCOMP conditions, both for the Dec- and the Q-type sentences. A similar result was obtained for the NNS group: they accepted the QM conditions more than the DeCOMP conditions, regardless of the sentence type.

Table 1. Mean ratings (standard deviations) of the experimental sentences in the acceptability judgment task

Group	QM_Dec	QM_Q	DeCOMP_Dec	DeCOMP_Q
NS (n = 30)	3.69 (0.7)	3.65 (0.8)	1.10 (0.3)	1.38 (0.7)
NNS (n = 60)	3.80 (0.5)	3.68 (0.7)	2.42 (1.2)	2.47 (1.2)

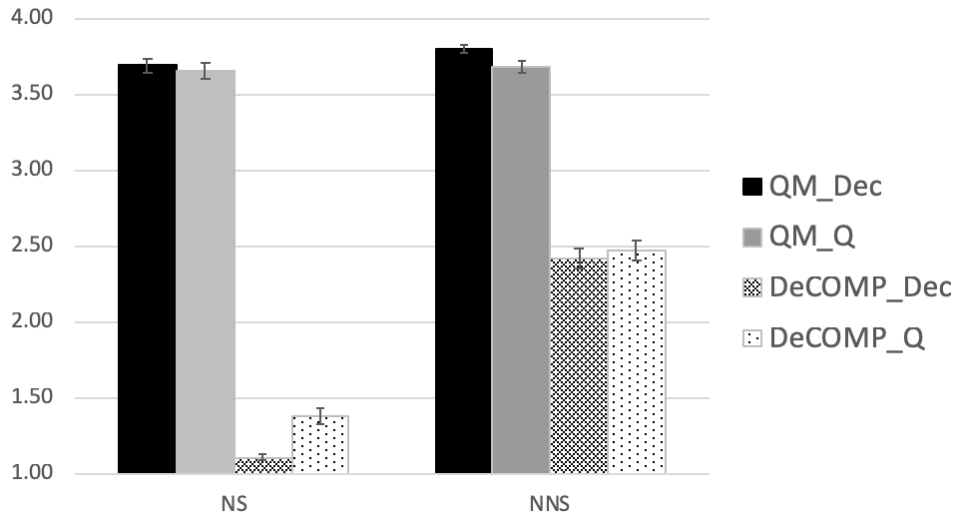

Figure 1. Results of the acceptability judgment task; error bars indicate 95% confidence intervals

Table 2 summarizes the output of the mixed-effects model. The model showed a main effect of *Group* (b = 0.66, SE = 0.09, p < .001), indicating higher acceptance rates in the NNS than the NS group in general. Importantly, there was a main effect of *Embedded clause marker* (b = 1.69, SE = 0.09, p < .001), with higher acceptance rates for the QM conditions than for the DeCOMP conditions. This effect of *marker* interacted with *Group* (b = –1.14, SE = 0.18, p < .001) such that the degree of accepting the QM conditions relative to the DeCOMP conditions differed between the NS and the NNS groups. Our analysis also showed an interaction between *Embedded clause marker* and *Sentence type* (b = –0.23, SE = 0.06, p < .001), driven by the lower acceptance rates for the DeCOMP_Dec than for the other conditions. Meanwhile, there was no main effect of *Sentence type* (b = 0.02, SE = 0.04, p = .636) or any other interaction beyond the interaction between *Group* and *Sentence type* and between *Group, Embedded clause marker* and *Sentence type*.

To unpack the interactions and fully investigate the non-native speakers' grammatical judgment relative to that of native speakers, we conducted separate analyses within each

group, including *Embedded clause marker* (QM, DeCOMP) and *Sentence type* (Dec, Q) as fixed effects. As in the previous model, the by-group models included the maximal random effects structure allowed by the design. Because we conducted two separate analyses for each group, we adjusted the alpha level to .025 (.05/2).

As shown in Table 2, the model for the NS group revealed a main effect of *Embedded clause marker* (b = 2.42, SE = 0.09, p < .001), with higher acceptance rates in the QM conditions than in the DeCOMP conditions. This effect interacted with *Sentence type* (b = –0.33, SE = 0.12, p = .011), driven by the higher acceptance rates for the DeCOMP_Q condition than for the DeCOMP_Dec condition. Nevertheless, given that the acceptance rates for these DeCOMP conditions were less than 1.5 (out of 4), the results of the NS group indicate that they generally accepted the QM conditions while rejecting the DeCOMP conditions, confirming their knowledge of the morphological constraints associated with embedded *wh*-questions in Korean.[4]

Turning to the NNS group, the model demonstrated a main effect of *Embedded clause marker* (b = 1.29, SE = 0.12, p < .001), indicating that this group accepted the QM conditions significantly more than the DeCOMP conditions. There was no main effect of *Sentence type* (b = –0.04, SE = 0.06, p = .547), and we found no interaction between *Embedded clause marker* and *Sentence type* (b = –0.17, SE = 0.08, p = .033) at the adjusted alpha level. These results suggest that the NNS group had sufficient knowledge to distinguish the grammaticality of the QM and the DeCOMP conditions, regardless of the sentence type. However, the degree of their rejection of the DeCOMP conditions was not as strong as that of the NS group. We discuss this point in detail in the discussion section.

4 The interaction between *Embedded clause marker* and *Sentence type* was not expected nor designed as an explanatory factor. The NS group generally accepted the grammatical conditions and rejected the ungrammatical conditions, although the effect of *Embedded clause marker* interacted with *Sentence type* at the adjusted alpha level.

Table 2. Results of the mixed-effects models

	ß	SE	*p*
Full model			
(Intercept)	2.86	0.04	.356
Group	0.66	0.09	< .001
Embedded clause marker	1.69	0.09	< .001
Sentence type	0.02	0.04	.636
Group × Embedded clause marker	–1.14	0.18	< .001
Group × Sentence type	–0.17	0.10	.087
Embedded clause marker × Sentence type	–0.23	0.06	< .001
Group × Embedded clause marker × Sentence type	0.15	0.13	.225
NS model			
(Intercept)	2.44	0.06	< .001
Embedded clause marker	2.42	0.09	< .001
Sentence type	0.12	0.07	.094
Embedded clause marker × Sentence type	–0.33	0.12	.011
NNS model			
(Intercept)	3.09	0.05	< .001
Embedded clause marker	1.29	0.12	< .001
Sentence type	–0.04	0.06	.547
Embedded clause marker × Sentence type	–0.17	0.08	.033

5.3 Effects of L2 proficiency

To inspect the modulating role of proficiency in L2 participants' grammatical knowledge of target sentences, we plotted participants' TOPIK scores (z-score transformed) along with the acceptance rate difference between the QM and DeCOMP conditions for each sentence type. As Figure 2 shows, L2 participants provided higher ratings for the QM than the DeCOMP conditions as their proficiency increased, as reflected in the moderate correlations between TOPIK scores and the differences in ratings between the QM and DeCOMP conditions in each sentence type (r = .47 in Dec-type sentences; r = .51 in Q-type sentences).

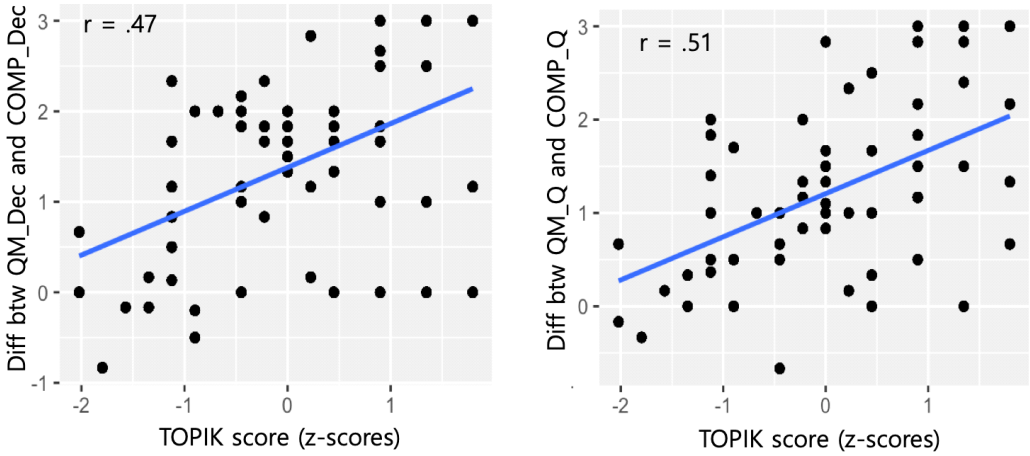

Figure 2. Correlation between TOPIK scores and differences in ratings between QM_Dec and COMP_Dec conditions (left) and correlation between TOPIK scores and differences in ratings between QM_Q and COMP_Q conditions (right)

The interacting effect of proficiency was further confirmed by a mixed-effect regression model for the L2 data that included *Proficiency* (TOPIC scores) as a continuous factor along with the fixed effects of *Embedded clause marker* and *Sentence type*. As with the by-group analyses, we adjusted the alpha level to .025. The model showed a main effect of *Embedded clause marker* (b = 1.30, SE = 0.10, p < .001), again with significantly higher rates for the QM than the DeCOMP conditions. Notably, the effect of *Embedded clause marker* was modulated by Proficiency (b = 0.47, SE = 0.10, p < .001) such that the differences in ratings between the QM and the DeCOMP conditions were greater as participants' proficiency increased. We found no robust effect of *Sentence type* or any other interaction. Overall, the results suggest that L2 proficiency significantly influenced the extent to which L2 participants accepted the QM while rejecting the DeCOMP conditions.

In light of the significant interaction between proficiency and clause marker, we further divided the L2 participants into two groups, a higher-proficiency (HL) group and a lower-proficiency (LL) group, based on the median split in the proficiency scores. Table 3 presents the mean acceptance rates in the two proficiency groups, followed by a graphical illustration in Figure 3.

Table 3. Mean ratings (standard deviations) of the experimental sentences in the acceptability judgment task in the two proficiency groups

Group	QM_Dec	QM_Q	DeCOMP_Dec	DeCOMP_Q
HL (n = 30)	3.94 (0.2)	3.81 (0.6)	2.23 (1.2)	2.27 (1.2)
LL (n = 30)	3.65 (0.7)	3.55 (0.8)	2.61 (1.1)	2.67 (1.1)

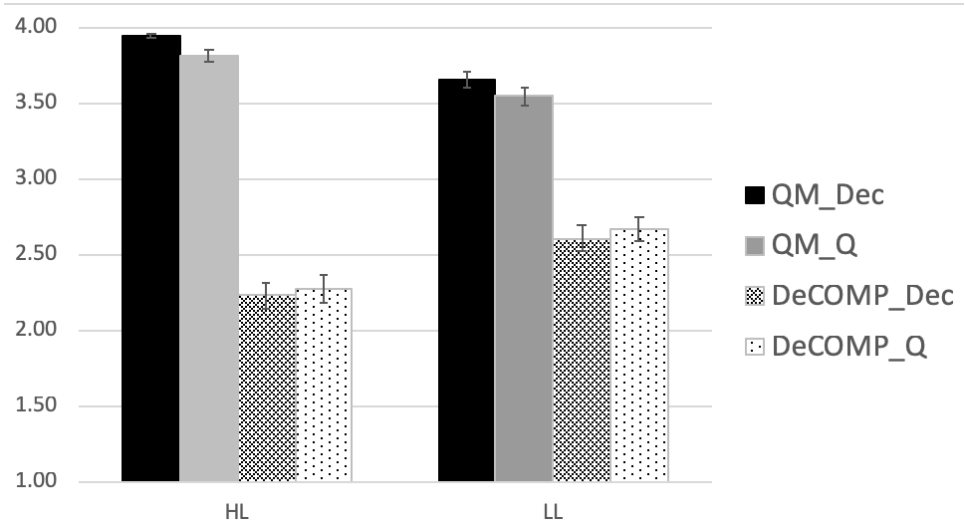

Figure 3. Results of the acceptability judgment task for the two proficiency groups; error bars indicate 95% confidence intervals

To statistically compare the performance of the two proficiency groups, we conducted a linear fixed effects regression, including *Proficiency level* (HL, LL), *Embedded clause marker* (QM, DeCOMP), and *Sentence type* (Q, Dec) as fixed effects, along with the random effects of participant and group. The model included the maximal random effects structure allowed by the design. Again, the alpha level was adjusted to .025.

The model revealed a main effect of *Embedded clause marker* (b = 1.30, SE = 1.11, $p < .001$), with higher acceptance rates in the QM than the DeCOMP condition. We found no reliable effect of *Proficiency level* (b = 0.05, SE = 0.10, p = .604) or *Sentence type* (b = –0.03, SE = 0.06, p = .560). Importantly, however, the model showed a significant interaction between *Proficiency level* and *Embedded clause marker* (b = –0.67, SE = 0.22, p = .004), indicating that the two proficiency groups differed in the degree of rating the sentences with the two embedded clause marker types. We found no other interactions.

To unpack the interaction between *Proficiency level* and *Embedded clause marker*, we conducted separate analyses for each proficiency level, including *Embedded clause*

marker and *Sentence type* as fixed effects. We further adjusted the alpha level to .017 (.025/2). The model for the HL group showed a significant effect of *Embedded clause marker* (b = 1.63, SE = 0.17, p < .001) without a main effect of *Sentence type* or an interaction between the two factors. Likewise, the model for the LL group revealed a significant effect of *Embedded clause marker* (b = 0.96, SE = 0.14, p < .001), not modulated by *Sentence type*. These results indicate that both proficiency groups accepted the sentences in the QM conditions more often than in the DeCOMP conditions. Overall, the proficiency-based analyses of the L2 data suggest that both lower- and higher-proficiency groups acquired the target-like linguistic knowledge underlying the morphological constraints in the embedded question clause in Korean, although the tendency was stronger for the HL group than for the LL group.

6. Discussion

The primary goal of this study was to test whether L2 learners can restructure their interlanguage grammars by resetting parameter values. To this aim, we presented Chinese-speaking L2 learners of Korean and Korean L1 speakers with the Korean sentences involving embedded question clauses that were marked either by a licit question marker or by an illicit declarative complementizer in a declarative or question sentence. In our analyses of participants' acceptability judgment, we addressed whether Chinese speakers, despite the lack of morphological marking in their L1, would show sensitivity to the manipulation of morphological markers for embedded question clauses in Korean. We found that both native speakers and L2 learners accepted the sentences with the embedded question clause followed by a question marker but rejected the sentences when the embedded question clause was incorrectly modified by a declarative complementizer. This tendency was consistent across the declarative and question sentences, indicating that the L2 learners were not affected by the sentence type in their grammatical judgment of the morphosyntactic realizations for the embedded clause markers. These results suggest that they had acquired target-like knowledge of morphosyntactic constraints in Korean embedded *wh*-clauses.

Among the three hypotheses regarding L2 parameter resetting sketched in the literature review section—the Full Transfer Full Access Hypothesis (FTFA), the No Parameter Resetting Hypothesis (NPRH), and the Feature Reassembly Hypothesis (FRH)

—our findings exclusively support the FTFA. This hypothesis predicts that L2 acquisition of morphosyntactic components is constrained by the same mechanism that guides L1 acquisition, and thus L2 learners can acquire new parameter values in response to L2 input (Schwartz and Sprouse 1996). In line with this prediction, the Chinese-speaking learners in our study demonstrated judgment patterns comparable to those of native speakers. It appears that the learners had acquired sufficient knowledge of grammar to recognize morphological markings as important licensors for embedded clauses in Korean. Given that the learners showed target-like performance in spite of the significant difference between their L1 and L2 in terms of the type of licensors for embedded question clauses, our results are incompatible with the NPRH's prediction that parameter resetting is impossible for features not instantiated in learners' L1. If the learners had failed to reset the parameter values associated with the morphological marking and relied on their L1 grammar as predicted by the NPRH, they would not have been able to reject the sentences with embedded question clauses marked by incorrect licensors (i.e. a declarative complementizer) since the corresponding sentences in their L1 do not involve overt markings for embedded clauses. The learners' target-like performance in our study is also difficult to reconcile with the FRH, which predicts that conflicting features between L1s and L2s will hamper parameter resetting. When Chinese-speaking learners process an embedded question clause in Korean, they need to override the L1 feature [-morpheme] with the target language feature [+morpheme]. Our findings suggest that the learners successfully resolved the conflict arising from this feature clash, accepting the sentences only when correct morphological licensors were chosen for embedded question clauses.

Notably, although the L2 learners' judgment patterns resembled those of native speakers, they did not completely reject the ill-formed sentences with the wrong licensors for the embedded clauses, as indicated by the relatively higher acceptance rates for these sentences in the L2 group (mean rates of 2.42 in the declarative and 2.47 in the question sentences) than in the native speaker group (mean rates of 1.10 in the declarative and 1.38 in the question sentences). One might interpret these results as highlighting learners' difficulty with complete parameter resetting or as evidence of L1 interference. However, these results should be taken with caution due to the varying degrees of proficiency in the learner group. When we included learners' proficiency in Korean as an additional factor, we found a significant interaction between proficiency and learners' acceptability judgment rates, indicating that the learners were more likely to accept sentences with

correct licensors and reject sentences with incorrect licensors as their proficiency increased. The modulating role of proficiency in the acquisition of morphological constraints in Korean suggests that proficiency affords learners the abilities to adjust parameter values, providing further support for the FTFA. The FTFA holds that learner grammar starts out with L1-specific properties (full transfer) and then gradually progresses toward target-like grammar through parameter resetting on the basis of input (full access). Consistent with this prediction, the learners with lower proficiency in our study were less likely to perform target-like judgment of the experimental sentences, suggesting that they may still be in the process of shifting from an L1-specific grammar to a more target-like grammar. For the learners with higher proficiency, in contrast, it seems that restructuring took place to a greater extent compared to the lower proficiency learners, as this group was more likely to converge on target-like grammar. In general, our findings adduce some evidence of L1 influence, as shown in the performance of the lower-proficiency learners, as well as evidence for parameter resetting, as reflected in the higher L2 proficiency learners' stronger convergence on target-like grammar. Considering the crucial role of proficiency in driving the acquisition of the target grammar, we expect our participants to ultimately reset parameter values and display native-like performance as they accumulate more experience with the target language.

To the extent that our findings are consistent with the FTFA, the learners' sensitivity to the grammatical violations in embedded clauses with wrong licensors indicates that the L2 acquisition of morphological features depends on the same mechanisms that constrain L1 acquisition. For decades, researchers have debated whether L2 acquisition is fundamentally different from L1 acquisition, proposing various theories regarding the issue (for a review, see White 2003). Some researchers have argued that L2 acquisition is qualitatively and fundamentally different from L1 acquisition (e.g. Bley-Vroman 1990; Bley-Vroman and Yoshinaga 1992), claiming that the mechanisms that operate in child L1 acquisition do not constrain interlanguage grammars. Alternatively, others have provided evidence that L2 acquisition follows the same developmental trajectories as L1 acquisition, although interlanguage grammars may display non-target-like properties in some respects due to performance-related problems (Epstein et al. 1996; Schwartz and Sprouse 1994, 1996). Our findings support the later position, showing that the L2 learners rely on a structural architecture constrained by the same cognitive mechanisms that operate in L1 acquisition, at least in the acquisition of morphological restrictions regarding the licensors for embedded question clauses in Korean. Whether these learners

had native-like knowledge in other domains in Korean remains an interesting question that will require further research.

Our findings have implications for teaching Korean specific knowledge to L2 learners. We have shown that the morphosyntactic information regarding the *wh*-embedded clause is acquirable, yet fully internalizing the constraints appears challenging to some learners, as suggested by our observation that even advanced learners of Korean did not reject the ill-formed sentences as confidently as the native speakers did. These results suggest that target structures involving the integration of morphological and clausal information may pose learning difficulties for L2 learners, particularly when the relevant information is unavailable in learners' L1. However, these challenges may be alleviated by providing an explicit instruction on the target structures. For example, teachers may explain that embedded *wh*-phrases in Korean cannot be licensed by overt declarative complementizers when followed by question-selecting predicates like *kwungkumha* "wonder." Teachers may also combine such explicit instruction with various types of tasks designed to help increase learners' awareness of grammatical constraints, such as consciousness-raising tasks (e.g. Ellis 1991; Rutherford and Sharwood Smith 1985) and input enhancement (e.g. Sharwood Smith 1993). Moreover, corrective feedback from teachers may help learners avoid errors and acquire the necessary knowledge of the target structures.

7. Conclusion

Aiming to evaluate the Chinese L2 learners' knowledge of Korean embedded *wh*-clauses, this study conducted an acceptability judgment task. Our analyses of the learners' acceptability judgment of the target sentences in comparison to native speaker performance showed that the learners had target-like knowledge of the morphological constraints underlying the target structure, suggesting successful parameter resetting in their interlanguage grammars. We also found that L2 parameter resetting is modulated by L2 proficiency. These findings are consistent with the position that L2 parameter resetting is guided by the same mechanisms that operate in L1 acquisition. We note some limitations: First, the use of TOPIK as a measure of learner Korean proficiency may not have completely captured the participants' linguistic knowledge since the test mainly taps into knowledge in academic domains. Future research should employ proficiency tests

that directly measures the knowledge of the target structures. Another limitation comes from our focus on the offline acceptability judgment task, which hardly captures participants' real-time sentence processing. The current study may benefit from further research—for example, a study testing L2 learners' online processing of embedded *wh*-clauses or a study comparing two learner groups with different L1 backgrounds. Such additional investigations could advance our understanding of how parametric differences and similarities between L1s and L2s affect the ultimate target structure attainment and acquisition in L2 learners.

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