

# Investigating L3-to-L2 Transfer in Reflexive Pronoun Interpretation: A Study of Korean-English-Chinese Unbalanced Trilinguals

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## ABSTRACT

This study investigates the phenomenon of reverse (backward) transfer in third language acquisition (TLA), focusing on whether knowledge of a later-acquired L3 (Chinese) can influence the interpretation of morphosyntactic features in a previously acquired L2 (English). Specifically, the interpretation of reflexive pronouns in English among Korean-English-Chinese (KEC) unbalanced trilinguals was examined using the Truth Value Judgment Task (TVJT). The KEC trilinguals with high L2 proficiency outperformed the KE control group, suggesting a facilitative effect of the L3 Chinese language on L2 English reflexive interpretation. Additionally, the KEC participants exhibited a more stable performance in the short- and long-distance binding conditions. These findings support the view that L3 can exert backward influence under certain linguistic conditions and contribute to ongoing discussions on cross-linguistic interaction in multilinguals. The results are interpreted within the framework of several L3 transfer models. This study fills a gap in TLA literature by providing behavioral evidence of the L3-to-L2 influence, challenging the traditional assumption of unidirectionality in language transfer models.

**Keywords:** third language acquisition (TLA), reverse/backward transfer, reflexive pronouns, crosslinguistic influence, Korean-English-Chinese trilinguals

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## 1. Introduction

In recent years, research on trilingual language acquisition and processing has gained increasing attention, reflecting the growing linguistic diversity in globalized

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societies. While bilingualism has long provided a foundation for examining how two languages are acquired and processed, recent research on trilingualism or multilingualism has begun to offer a more complex and realistic framework for understanding multilingual cognition as it occurs in everyday language use. Trilingual individuals must manage not only cross-linguistic influences between two foreign language systems but also dynamic interactions across three languages that may differ in typology, proficiency, and acquisition order. This added complexity offers a unique opportunity to refine theoretical models of language transfer, cognitive control, and crosslinguistic interaction in multilingual contexts.

Given the greater number of factors involved in third language (L3) acquisition (TLA), one of the central issues in the field is determining how each language influences the others- that is, identifying the directionality of linguistic transfer and the source language involved in the cross-linguistic transfer process. Earlier studies in bilingualism have mainly focused on the effects of first language (L1) on second language (L2) acquisition (Kellerman, 1983; Odlin, 1989; Ringbom, 1986; White, 2003). More recent research, however, has started to show that the influence between languages is not unidirectional: L2 can also affect L1, revealing a bidirectional dynamic in crosslinguistic interaction (Brown & Gullberg, 2008; Liu & Qi, 2020; Pavlenko & Jarvis, 2002). As the scope of inquiry expanded to include TLA, researchers have found that the transfer patterns in L3 learning are often more complex than those found in L2 learning due to the triadic interaction among languages (Bardel, & Falk, 2007; Marx & Hufeisen, 2004). To account for these complexities, several theoretical models have been proposed, such as the L2 Status Factor, or Cumulative Enhancement Model (CEM), which will be discussed in detail in subsequent sections. Crucially, they aim to explain how L3 engages in dynamic and reciprocal influence with other previously acquired languages in a multilingual speaker's system.

Emerging studies in this field have begun to map out how trilingual speakers acquire and process grammatical features such as gender agreement, case-marking, or anaphora resolution, often revealing asymmetrical influences across languages (Cabrelli Amaro, 2017; Falk & Bardel, 2011; Rothman, 2011; Slabakova & Garcia Mayo, 2015). Many of the existing studies thus far have examined whether and to what extent L1 or L2 influence on L3 learning, commonly referred to forward transfer (Bardel & Falk, 2007; Falk, Lindqvist, & Bardel, 2015; Hammarberg, 2001; Hermas, 2014). Despite the importance of considering the multidirectional nature of crosslinguistic transfer, relatively few studies have examined whether and how

a newly acquired L3 influences the performance or processing of previously learned languages, which is known as backward/reverse transfer (cf. Ahn & Mao, 2019; Chen, 2020). To gain a comprehensive understanding of crosslinguistic transfer in trilingual contexts, it is essential to examine whether the L3 can exert influence not only on the dominant L1 but also on the previously acquired L2, potentially leading to restructuring or interference effects.

Aligning with global research trends, the present study aims to address a gap in the literature on TLA by focusing on the underexplored phenomenon of reverse transfer (L3 to L2) in the interpretation of reflexive binding, with unbalanced Korean-English-Chinese trilinguals. In doing so, it seeks to provide behavioral data from speakers with diverse linguistic backgrounds—specifically, Korean, English, and Chinese, to discuss the findings within the framework of L3 transfer models, and to deepen our understanding of the dynamics of multilingual language processing.

## 2. Theoretical Background

Research on third language acquisition (TLA) has increasingly recognized that multilingual language processing is not a simple extension of bilingualism but involves unique dynamics shaped by the interaction of multiple linguistic systems. One of the core questions in this domain concerns the source of transfer during L3 development—namely, whether the first language (L1), the second language (L2), or both influence the acquisition of the L3, and under what conditions. In response to this, several theoretical models have been proposed to account for the directionality, selectivity, and mechanisms of crosslinguistic transfer in L3 acquisition. These models aim to explain not only which language is most likely to serve as the source of transfer, but also how typological similarity, language proficiency, recency of use, and cognitive factors interact in shaping L3 outcomes.

The first one is the L2 Status Factor (L2SF) model, which basically posits that transfer in L3 acquisition tends to originate from the L2, rather than the L1. This preference is attributed to the cognitive and representational proximity between the L2 and L3, both of which are typically learned later in life and are thus more likely to be stored and accessed through similar explicit memory systems. For example, Williams and Hammarberg (1998) argued that L2 plays a more dominant role than L1 when learners acquire an L3, and Bardel and Falk (2007) further suggested that

L2 can even inhibit L1-based transfer to L3. Additionally, Falk and Bardel (2011) examined L3 German learners from two groups, L1 French-L2 English and L1 English-L2 French, and found that each group performed more accurately on grammatical structures resembling their L2. More recently, Wenzel (2018) supported the L2SF model, with experiments involving German-speaking learners of Dutch who have English as their L2. The study demonstrated robust transfer effects from L2 English to L3 Dutch, even in cases where Dutch is typologically more similar to the learners' L1 German.

Another early model in TLA is the Cumulative Enhancement Model (CEM) (Flynn, Foley, & Vinnitskaya, 2004). It offers a more liberal and facilitative account of transfer, proposing that any previously acquired language—L1 or L2—can contribute to L3 acquisition, provided the transferred feature facilitates learning. Notably, non-facilitative transfer is ruled out, as the model assumes that the parser will avoid using prior knowledge that would impede L3 development. In support of this view, Onishi (2013) conducted an experiment with Korean-English-Japanese trilinguals and found that prior experience with English had a facilitative effect on the acquisition of Japanese phonological contrasts, even in domains where the two languages share low phonological similarity. Next, the other influential model in shaping current theories of L3 transfer would be the Typological Primacy Model (TPM), proposed by Rothman (2011). This model suggests that the language that is structurally most similar to the L3 serves as the primary source of transfer during L3 acquisition. Importantly, the TPM emphasizes the key role of the structurally closest previously acquired language in crosslinguistic transfer during L3 acquisition.

Similarly, the Linguistic Proximity Model (LPM) argues that language transfer can occur simultaneously from multiple previously acquired languages, depending on their structural similarity to the target language (Westergaard, Mitrofanova, Mykhaylyk, & Rodina, 2017). While it aligns with the TPM in recognizing the role of structural similarity, the LPM allows for transfer to occur at the level of specific grammatical properties from either L1 or L2, rather than from a single dominant language system. For example, Westergaard et al. (2017) found that different grammatical features in the L3 can be selectively influenced by structurally similar elements in different background languages, more focusing on property-by-property view of crosslinguistic transfer. More recently, sharing some theoretical ground with the LPM, the Scalpel Model proposed by Slabakova (2017) posits that transfer occurs selectively within and across L1 and L2, allowing for more fine-grained, localized influence. According to the Scalpel Model, learners draw on grammatical features

from either L1 or L2 as needed, carefully selecting only those elements that support L3 acquisition. For example, Clements and Domínguez (2018) demonstrated that different grammatical properties—such as Null Subject and Overt Subject constructions—can be selectively transferred from L1 English and L2 Spanish in L3 Chinese acquisition. By emphasizing an even more precise level of transfer than the LPM, the Scalpel Model highlights the localized and selective nature of transfer, gaining increasing attention in recent research in TLA.

Since the aforementioned models aim to explain how L3 development is shaped by previously acquired languages, their underlying assumption is typically unidirectional, emphasizing forward transfer from L1 or L2 to L3. However, some of these models appear relevant to the analysis of reverse transfer in the present study, offering a degree of conceptual flexibility. Notably, although the L2 Status Factor (L2SF) model and the Cumulative Enhancement Model (CEM) were originally developed to explain forward transfer, their underlying mechanisms, such as the role of metalinguistic awareness and the assumption of non-exclusive, facilitative influence, can be plausibly extended to account for reverse transfer from L3 to earlier acquired languages. Given that the L2SF model attributes transfer directionality to cognitive factors, including the shared memory representation of L2 and L3, it can permit the possibility of L3 influencing L2, a hypothesis being examined in the present study. Furthermore, the CEM's assumption that transfer occurs only when it facilitates learning can provide a theoretical basis for interpreting instances where L3 knowledge contributes positively to L2 performance. If previously acquired linguistic systems remain cognitively accessible and are selectively activated based on perceived relevance or utility, then reverse transfer from L3 to L2 may emerge when the L3 provides more transparent or salient structures that enhance L2 processing. Thus, both the L2SF model and the CEM may offer plausible accounts for interpreting (positive) reverse transfer effects from L3 to L2 among Korean-English-Chinese (KEC) speakers in the present study.

As previously noted, a comprehensive understanding of L3 acquisition also requires attention to the possibility of reverse or backward transfer. This is particularly relevant considering evidence for bidirectional crosslinguistic influence in bilingual contexts (Brown & Gullberg, 2008; Liu & Qi, 2020; Pavlenko & Jarvis, 2002). While most of the existing research has focused on forward transfer (i.e., from L1 or L2 to L3), a small but growing body of studies has recently begun to investigate the effects of backward transfer from L3 to L2 (Ahn & Mao, 2019; Razkane & Diouny, 2024; Zheng, 2023). One of the existing studies, Ahn & Mao

(2019), which gives motivation to the current study, investigated whether speakers of Chinese-English-Korean (CEK) backgrounds exhibit L3-to-L2 backward transfer in the domain of reflexive pronoun interpretation in English, an area known to vary crosslinguistically. Using a Truth Value Judgment Task (TVJT), the study found that CEK speakers showed a stronger tendency to accept long-distance antecedents for English reflexives (*himself/herself*) compared to Korean-English (KE) bilinguals. The study suggests that L3 Korean may have reinforced metalinguistic awareness or sharpened the participants' sensitivity to binding domains in English.

Another study by Zheng (2023) examined reverse transfer effects from L3 (Korean or Japanese) to L2 (English) among native Chinese speakers. After three years of L3 learning, participants showed a significant increase in English errors across pronunciation, vocabulary, syntax, and pragmatics, confirming negative L3-L2 transfer. Korean learners exhibited greater syntactic and lexical interference than Japanese learners. These findings highlight that when L2 proficiency is less stable, L3 can interfere with prior language systems, underscoring the need for targeted pedagogical strategies. Interestingly, this study provides clear empirical evidence of negative backward transfer, emphasizing that L3 influence on L2 is not always facilitative and may hinder prior linguistic performance. This result, however, is inconsistent with the facilitative backward transfer observed in Ahn and Mao (2019). These inconsistent findings call for additional research on reverse transfer in trilinguals to better understand the underlying mechanisms.

More recently, Razkane and Diouny (2024) investigated reverse transfer by examining whether training Moroccan high school students in metacognitive reading strategies in English (L3) could enhance their reading comprehension in French (L2). After an English-based metacognitive reading strategies intervention given only to the experimental group, significant gains were observed not only in English (L3) but also in French (L2) reading comprehension and metacognitive awareness. These findings provide empirical support for the positive reverse transfer of cognitive strategies from L3 to L2 and suggest that explicit instruction in strategic reading skills in one language can pedagogically benefit learners' performance in another. In particular, the study clearly showed that the increase in metacognitive awareness fostered through L3 learning played a crucial role in enhancing learners' ability to apply reading strategies across languages.

Lastly, although not about reverse transfer, the recent study by Cabrelli and Iverson (2024) proposed the Cumulative Input Threshold Hypothesis (CITH), which highlights the importance of additional language experience in facilitating transfer

effects. The hypothesis posits that transfer in third language (L3) acquisition is shaped not only by language status or typological proximity, but also by the cumulative amount of input learners have received in their previously acquired languages. Based on data from Spanish subjunctive production among English—Spanish—Portuguese trilinguals, they demonstrated that facilitative transfer from either L1 or L2 occurs only when learners surpass a critical input threshold. Their findings underscore that input quantity plays a central role in enabling crosslinguistic transfer, particularly in morphosyntactic domains.

Given the scarcity of research on backward transfer in TLA, and the absence of a comparison group with a reverse acquisition sequence in Ahn & Mao (2019), the current study aims to extend this line of inquiry by examining Korean (L1)-English (L2)-Chinese (L3) unbalanced trilinguals. By including this multilingual profile, the study provides much-needed empirical evidence on L3-to-L2 influence, offering a complementary perspective to previous findings and contributing to a more comprehensive understanding of reverse transfer in TLA.

### 3. The Present Study

The present study examines how Korean (L1) -English (L2) -Chinese (L3) unbalanced trilinguals interpret and judge reflexive pronouns in English. Specifically, it investigates whether L3 Chinese exerts a backward influence on the interpretation of English reflexive binding, and whether this influence is modulated by L2 proficiency. By exploring these questions, the study advances our understanding of crosslinguistic transfer in multilingual contexts, particularly the conditions under which L3 can influence the ongoing development of L2 grammatical knowledge. The findings are interpreted in light of existing models of L3 transfer.

Reflexive pronouns exhibit language-specific binding properties across English, Korean, and Chinese. In English, reflexives such as *himself* must be locally bound within the same clause by a c-commanding subject, as stipulated by Chomsky's (1981) Binding Theory, and are subject to strict syntactic constraints (Baker, 1995). In contrast, Korean reflexives, including the simple form *caki* and the complex form *casin*, allow both short- and long-distance binding, with pragmatic and discourse-level factors playing a major role in antecedent resolution (Kim & Yoon, 2008). Similarly, Chinese reflexives, particularly *ziji*, are less constrained syntactically, permitting long-distance binding under strong pragmatic influence, while *ta-ziji* tends to favor

local binding (Huang, 1994). Overall, English reflexives are predominantly governed by syntactic principles, whereas Korean and Chinese reflexives demonstrate greater flexibility, with antecedent interpretation shaped by pragmatic and discourse-level cues. While a number of studies have explored cross-linguistic transfer in reflexive interpretation, most have focused on L2 contexts and forward transfer (e.g., Chen & Ionin, 2023, Kim & Joo, 2021; Kim, Montrul & Yoon, 2008). In contrast, reverse transfer—particularly within an L3 acquisition framework—has received far less attention, highlighting a critical research gap that the present study aims to address.

Therefore, this study focuses on addressing two primary research questions. First, it investigates whether Korean-English-Chinese (KEC) unbalanced trilingual speakers exhibit reverse transfer effects similar to those observed in Chinese-English-Korean (CEK) speakers in Ahn & Mao (2019). Specifically, possible predictions include: (a) facilitative reverse transfer, evidenced by KEC outperforming KE, potentially due to metalinguistic knowledge or cumulative input acquired through L3; (b) non-facilitative transfer, wherein interference from L3 Chinese negatively impacts L2 performance due to the structural differences in reflexive binding between L2 and L3; or (c) no observable transfer effect, suggesting that L3 is independent of L2 in reflexive binding. Second, this study explores which L3 acquisition models, if any, could best account for the observed reverse transfer effects. Ahn & Mao (2019) interpreted CEK group's facilitative transfer patterns as partially supporting the CEM and L2SF models. The current study adopts a similar analytic framework in examining whether KEC speakers would show comparable patterns. If non-facilitative transfer is observed, models such as CEM, which presumes only positive or neutral effects from prior language knowledge, would not be able to account for the results. Likewise, models that assume transfer is based solely on L1 (e.g., L1 Transfer Hypothesis) or on structural proximity (e.g., TPM, LPM, Scalpel Model) would be insufficient, as Chinese and Korean are structurally similar in reflexive binding, but both differ from English. On the other hand, if facilitative transfer occurs, it would be able to be discussed within both the CEM and L2SF models.

### 3.1. Method

#### 3.1.1. Participants

Two groups of Korean participants took part in the present study. The

experimental group (KEC) consisted of 56 Korean individuals who sequentially acquired Korean, English, and then Chinese. Most of them were undergraduate students enrolled at large universities in Seoul, and they reported frequent engagement with both English and Chinese for academic or occupational purposes. As a control group (KE), 60 Korean participants who had acquired only Korean and English were recruited. Participants in the KE group shared similar demographic and language background characteristics, except for the absence of Chinese as an additional third language. They were compensated for their participation after the experiment.

### 3.1.2. Materials

Stimuli sentences and conditions were all adapted from the studies of Ahn & Mao (2019). Two types of reflexive bindings in short distance (SD) and long distance (LD) were used in the Truth-Value Judgement Task (TVJT) in the current study. An example of each SD and LD condition, as well as a filler, is presented in (1) below.

(1) a. Short Distance (SD) condition

Jennifer: Do you remember our game for today's party?

Annie: Certainly.

Jennifer: I'm the one that will enter the circle first. Make sure you're not the one who enters first, O.K.?

Annie: I know!

[Sentence] Jennifer told Annie to put herself first in a circle.      YES    NO

b. Long Distance (LD) condition

Linda: Hi, Kim. How is your project going?

Kim: Time is running out and there are so many things to do.

Linda: I can help you in getting participants, and Cindy is very good at data analysis.

[Sentence] Linda advised Kim to involve Cindy and herself in the project.      YES    NO

c. Filler condition

George: Hi, Mitchell. Finally, I sold my car yesterday. Have you ever sold a car?

Mitchell: I'm just talking about it with my wife. We have decided to keep my car and sell hers.

George: Why do you want to keep your car?

Mitchell: It's because mine is newer than my wife's.

[Sentence] Mitchell sold his car.

YES NO

A total of 24 target items were used: half represented the short-distance condition, and the other half the long-distance condition. An additional 12 filler items were included to prevent participants from focusing specifically on reflexive usage during the judgment task.

### 3.1.3. Designs and procedures

Given that participants were located across various regions, all experimental tasks (the main TVJT, L2 and L3 proficiency tests) were conducted online. To ensure procedural reliability, participants were encouraged to complete the task in a single sitting once they began. The task was administered via Google Forms, using materials that directly replicated the original stimuli and structures from Ahn & Mao (2019). Participants started with L2 proficiency test, which was assessed using the Cambridge Quick Placement Test (Version 2). This test consists of 60 multiple-choice questions covering reading comprehension and grammar, and it is considered appropriate for evaluating the linguistic abilities required for the TVJT task. On average, participants completed the test in approximately 35 minutes. After finishing the L2 proficiency test, they were asked to complete L3 proficiency test, assessed by administering a Mini HSK test. The Mini HSK items were adapted from Jang (2018); the test consisted of 26 items in total, including multiple-choice questions targeting vocabulary and grammar knowledge, as well as short-answer sequencing tasks designed to evaluate sentence-level meaning and structure. The test was generally completed in about 20 minutes.

Participants who completed the L2 and L3 proficiency tests (only the L2 test for KE group) proceeded to the main task of this study: the Truth Value Judgment Task (TVJT). In this task, participants were asked to read each sentence and respond “Yes” if they judged the sentence to be true and “No” if they judged it to be false. Each item was constructed to assess participants' grammatical and semantic interpretation abilities. A sample sentence can be seen in (1) above in Material section. To control for order effects, the items were randomly presented

to participants. This was achieved by using the “shuffle question order” function in Google Forms, and item numbers were intentionally omitted to prevent participants from inferring any fixed sequence. The main task was completed in approximately 35 minutes.

### 3.1.4. Results

To examine whether and how proficiency in L2 and L3 affects the judgment of reflexive pronoun binding, participants were divided into four groups of L2 proficiency, based on the median score on the Cambridge Quick Placement Test: KEC\_high, KEC\_low, KE\_high, and KE\_low. Paired *t*-tests were performed to compare whether the mean of each group is significantly different from each other. According to the results of the *t*-test analyses, significant differences were found in pairs between KE\_low- KE\_high, between KEC\_high and KEC\_low, and between KE\_low and KEC\_low (both *ps* <.05). However, no significant difference was observed in pair between KE\_high and KEC\_ high (both *ps* > .10). Table 1 shows the average scores of L2 proficiency test in each group.

**Table 1.** The mean scores in L2 proficiency test for each group

Group	# of subject	<i>M</i>	<i>SD</i>
KE_high	29	45.33	4.163
KE_low	31	31.07	4.402
KEC_ high	25	46.44	4.779
KEC_low	31	32.67	4.373

To compare whether L3 Chinese proficiency level is statistically different in KEC\_high and KEC\_low group, another paired *t*-test was performed, and it was not significant (*p* >.10). Since the target language in the current experiment was English (L2), we did not further group participants by L3 Chinese proficiency, as it was confirmed that there were no reliable differences in L3 proficiency within this group division. However, the absence of subgroup differences does not diminish the potential importance of L3 proficiency as a variable. Rather, we cautiously interpret this result as an indication that the L3 proficiency measure (i.e., Mini HSK) employed in this study may not have been sufficiently sensitive to capture the influence of L3 on performance in the TVJT task.

As for the Truth Value Judgment Task (TVJT), the main task's scores are presented in Table 2 in each group.

**Table 2.** The mean scores in Truth Value Judgment Task (TVJT) for each group

Group	# of subject	<i>M</i>	<i>SD</i>
KE_high	29	16.79	1.05
KE_low	31	15.74	3.12
KEC_high	25	17.29	0.82
KEC_low	31	15.82	3.31

First, a significance difference ( $t = -2.55, p = .01$ ) was yielded to show that the KEC group scored significantly higher than the KE group, suggesting that a reliable difference between groups in judgment performance on reflexive binding in English. Second, as seen in Table 2, as the raw mean scores seemed to be different depending on proficiency, the pairwise *t*-tests were performed across the four groups. Table 3 presents the results of the pairwise *t*-test analyses on the TVJT scores across the proficiency groups.

**Table 3.** The results of the pairwise *t*-test on TVJT scores across groups

		<i>t</i>	<i>p</i>
KE_high	KEC_high	-2.74	.01*
KE_high	KE_low	2.30	.03 <sup>†</sup>
KE_high	KEC_low	1.54	.13
KEC_high	KE_low	2.80	<.01*
KEC_high	KEC_low	2.80	.01*
KE_low	KEC_low	-0.57	.57

Note: \* significant at  $p < .05$ ; <sup>†</sup> marginally significant at  $p < .10$ .

It was found that the KEC\_high group performed significantly better than both KE\_Low and KEC\_Low, and more importantly, they were better than KE\_high group. Since the L2 proficiency in KEC\_high and KE\_high was not significantly different analyzed above (see Table 1), the higher performance on the TVJT by the KEC\_high group seems to be attributed to the additional L3, which will be more

discussed in Discussion section.

To further investigate whether and how KEC group and KE group differ in performing TVJT depending on the short-distance (SD) and long-distance (LD) binding conditions, we examined accuracy rates in each condition for two groups (KEC and KE). The KE group showed 73% accuracy in SD and 65% in LD; the KEC group yielded 70% in SD and 69% accuracy in LD. Table 4 showed the results of two-way mixed ANOVA with factors of group and condition.

**Table 4.** The results of two-way mixed ANOVA on accuracy for each group and condition

Effect	<i>F</i>	<i>p</i>
Group	F(1, 115) = 0.08	.78
Condition	F(1, 115) = 5.35	.02*
Group × Condition	F(1, 114) = 4.30	.04*

Note: \* significant at  $p < .05$ ; † marginally significant at  $p < .10$ .

There was a main effect of condition ( $p = .02$ ) and the interaction between group and condition ( $p = .04$ ), but no effect of group. This indicates that both KE and KEC groups performed better in SD condition than LD condition, and that the effect of condition on accuracy differed between KE and KEC groups. That is, while KEC group did not show reliable differences between SD (70%) and LD (69%) conditions, KE group exhibited a strong condition effect (76% for SD, 65% for LD).

#### 4. Discussion

The present study was designed to investigate whether and how L3 exerts any transfer influences on the interpretation of L2 morphosyntax. Specifically, we examined the backward transfer from L3 Chinese to L2 English when Korean-English-Chinese (KEC) unbalanced trilinguals interpret reflexive pronouns in English. Given the structural differences between English and Chinese in terms of reflexive binding domains, and the theoretical predictions of several L3 transfer models, this study aimed to determine whether the knowledge of a newly acquired L3 Chinese modulates a previously learned L2 English morphosyntactic information

and judgment. To this end, the Truth Value Judgment Task was conducted with the KEC group, compared to the KE control group, and the reading patterns were compared to the findings with CEK group, providing a mirror image, previously observed in Ahn & Mao's (2019) study. The current findings offer several implications for the field of third language acquisition (TLA), particularly with regard to reverse or backward transfer in crosslinguistic influence, which has been under investigation in this field, and thus may therefore extend existing L3 transfer models to account for such backward effects.

The first research question investigated whether and how L3 affects L2 in the interpretation of reflexive pronouns by Korean-English-Chinese unbalanced trilinguals, comparing with Korean-English bilinguals, thereby indicating a potential reverse transfer, either facilitative or non-facilitative. In the TVJT, participants in the KEC group performed better than those in the KE group ( $p = .01$ ), clearly suggesting that L3 Chinese facilitated the judgment of reflexive pronoun binding in English, even though the two languages differ in their morphosyntactic domains. This finding is consistent with the previous study of Ahn & Mao (2019), which reported that the mirror imaging group, the CEK speakers displayed a stronger tendency to accept long-distance antecedents for English reflexives (*himself/herself*) compared to Korean-English (KE) bilinguals. It is noteworthy that with L2 held constant, whether the L3 is Korean or Chinese, these studies suggest that acquiring an additional L3 can facilitate the interpretation of reflexive pronouns in L2 English, despite structural differences in reflexive bindings across all three languages.

Second, as for the proficiency effect, it was observed that significant differences between high and low proficiency subgroups within both KE and KEC groups (e.g, KE\_high vs. KE\_low) confirmed that L2 proficiency significantly contributes to reflexive binding judgment performance in general (see Table 3). However, more interestingly, the equivalence of high L2 proficiency in KE\_high and KEC\_high group, was able to isolate the influence of L3 Chinese. That is, given that the KE\_high and KEC\_high groups did not significantly differ in their L2 test scores, the KEC\_high group outperformed the KE\_high group on the TVJT, suggesting that additional experience with L3 Chinese may enhance metalinguistic awareness or allow for more flexible processing of reflexive binding. However, since metalinguistic awareness was not directly assessed in the present study, this remains a hypothesized explanatory factor rather than one supported by direct empirical evidence. This finding can further be supported by the Cumulative Input Threshold Hypothesis (CITH; Cabrelli & Iverson, 2024), which provides more concrete mechanisms for

understanding such facilitation. According to the CITH, transfer is likely to emerge only after learners surpass a critical threshold of input in the source language(s). In this case, the KEC\_high group's cumulative exposure to two languages that permit long-distance binding - L1 Korean and L3 Chinese - may have jointly contributed to a richer pool of structural input, enabling learners to reanalyze and adapt their interpretation of binding principles in L2 English. This pattern is consistent with the predictions of the CITH, highlighting the role of cumulative, crosslinguistic input in shaping multilingual syntactic processing.

Next to be discussed is the condition-specific analysis (short-distance (SD), long-distance (LD) binding condition). The statistical analysis revealed that while both groups performed better under short-distance (SD) conditions than long-distance (LD) conditions, the KE group showed a stronger condition effect, and this stronger condition effect only observed in the KE group yielded an interaction depending on group and condition. The KEC group's relatively stable performance across conditions suggests greater flexibility or robustness in handling binding ambiguity, potentially reflecting transfer effects from L3 Chinese, which allows for longer binding domains. Notably, this finding was in line with Ahn & Mao (2019)'s observation as well, that the CEK trilinguals were less disrupted by long-distance binding configurations. Furthermore, although the difference in LD accuracy between the KEC and KE groups (69% vs. 65%, respectively) was not statistically significant, this small numerical trend may warrant tentative consideration. While we refrain from drawing any firm conclusions, it is possible that the slightly higher LD performance of the KEC group reflects an emerging tendency that could, in theory, relate to interpretive preferences shaped by multilingual experience, rather than the application of explicit syntactic rules. However, given the lack of statistical significance, such an interpretation remains highly speculative. Future studies with larger samples and more sensitive measures are needed to determine whether this trend is replicable and theoretically meaningful.

Lastly, the present study's findings can be interpreted within the framework of several L3 transfer models. Although the existing L3 transfer models heavily focus on unidirectional influence as they were originally proposed to explain how L3 development is shaped by previously acquired languages, some of these models also appear theoretically compatible with the backward transfer observed in this study, due to their underlying assumptions about shared cognitive representations, co-activation, or language interaction within a multilingual system. For example, the L2 Status Factor (L2SF) model is based on the assumption that L2 and L3 as foreign

languages share representational space, which may permit influence from the L3 under certain conditions. In this study, the significant advantage observed in the KEC\_high group could reflect such a mechanism: as L3 Chinese becomes active and integrated, it may interact with L2 English within a shared cognitive architecture, facilitating backward transfer. In addition, the Cumulative Enhancement Model (CEM) permits transfer from any previously acquired language, regardless of its order of acquisition, as long as the transferred features result in facilitative effects. Although originally formulated to explain how L1 and L2 can support L3 development, the model's core assumption of cumulative, non-interfering enhancement can also account for the backward transfer observed in this study. The KEC\_high group's superior performance compared to the KE group, controlling for English proficiency, suggests that their L3 Chinese may have positively influenced their interpretation of reflexives in L2 English. This is in line with CEM's broader perspective that language systems interact in a way that prioritizes facilitative outcomes, even if the direction of transfer is from a more recently acquired language to an earlier one.

While this study offers meaningful evidence regarding L3-to-L2 transfer in trilingual learners, certain limitations should be noted to guide future investigations. First, the sample size, while adequate for initial statistical comparisons, limits the generalizability of the findings. Larger and more diverse samples would be needed to confirm the robustness of the observed backward transfer effects across different learner populations and language combinations. Second, although the study considered L3 proficiency when analyzing the data, the assessment may not have captured the full range of linguistic competence, particularly in domains relevant to reflexive interpretation. More fine-grained or task-specific measures of L3 proficiency would provide a clearer picture of the relationship between L3 development and its influence on L2 processing. Third, the study relied on a single experimental task, the Truth Value Judgment Task, which, while informative, may not fully reflect real-time processing mechanisms or general language use. It would be interesting to incorporate online measures to examine whether similar backward transfer effects emerge during real-time comprehension.

## 5. Conclusion

In general, the present study supports the hypothesis that L3 Chinese knowledge

can positively influence L2 reflexive pronoun interpretation, particularly among KEC trilinguals with high L2 proficiency. The significant advantage observed in this group, compared to the control KE group, suggests that L3 experience may enhance metalinguistic awareness and promote more flexible morphosyntactic processing in L2. This effect may reflect cumulative input across languages, as highlighted by the Cumulative Input Threshold Hypothesis (Cabrelli & Iverson, 2024), and may also be tentatively interpreted within the assumptions of the L2 Status Factor (L2SF) model and the Cumulative Enhancement Model (CEM), which, although originally proposed to account for forward transfer, may still be relevant to understanding the backward transfer effects observed in this study. These findings contribute to the growing body of evidence that multilingual language processing is shaped by dynamic, bidirectional cross-linguistic interactions, challenging the traditionally unidirectional assumptions of earlier transfer models. Importantly, the current study's findings demonstrate that L3 transfer can facilitate L2 sentence comprehension under certain linguistic conditions. By focusing on the influence of a later-acquired L3 on an earlier-acquired L2, this study fills a gap in the third language acquisition (TLA) literature, where the possibility of backward transfer has received limited attention. Future research should build on these findings by examining a wider range of linguistic structures beyond reflexive binding, incorporating both offline and online measures to capture real-time processing dynamics. Additionally, it would be valuable to explore how factors such as L3 usage frequency, language dominance, and individual cognitive differences mediate the direction and strength of crosslinguistic transfer.

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