



The Role of L2 Proficiency in the Backward Transfer of L3 on the Interpretation of L2 Reflexives

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ABSTRACT

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Situated in the context of third language acquisition, Ahn and Mao (2019) reported supportive evidence for the existence of backward transfer of L3 on the interpretation of L2 reflexives with three groups—a CE, a KE, and a CEK group. Nevertheless, whether the detected backward transfer was modulated by L2 proficiency remained unclear. As one of the potential contributing factors influencing crosslinguistic transfer, the role of L2 proficiency in the backward transfer needs to be clarified. The present study enrolled participants with CE, KE, and CEK language configurations and manipulated their L2 English proficiency levels to explore if L2-English proficiency modulated the backward transfer detected in the binding interpretation of normal and exempt anaphors with L2 and L3 learners. The results of the contrastive study did not reveal positive evidence for a decisive role of L2 proficiency, which indicated that the developmental path towards the target grammar of reflexive binding was not reflected by the general proficiency measured in traditional ways. Furthermore, the results reinforced the conclusion Ahn and Mao (2019) had drawn previously that the differentiating performance of the KE, the CE, and CEK group in the reflexive interpretations was less likely to be introduced by the significant difference in their L2 scores.

KEYWORDS

reflexive, L3 acquisition, backward transfer, proficiency

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1. Introduction

In recent years, a broad range of work has been and continues to be conducted on multilingual acquisition (L_nA) in various theoretical and applied linguistics sub-branches. One of the issues in the L3/ L_n acquisition studies is the nature of crosslinguistic influence (CLI)—the source and directionality of linguistic transfers and the contributing factors modulating this process. While studies on forward (progressive) transfer from L1 and/or L2 to L3 or more additional languages (L_n) have burgeoned over the last two decades, the study of backward (regressive, reverse) transfer is still in its infancy. Nevertheless, the thriving of the recently emerging field signals an interest in endeavoring toward a comprehensive understanding of the multifarious processes and the influential factors involved in language acquisition.

L3A is a more complex process than L2A due to the involvement of a more significant number of confounding factors. Murphy (2003) argued that among all others, five factors should be taken into consideration: 1) proficiency, 2) the amount of target language exposure and use, 3) language mode, 4) age, and 5) educational background.

Regarding the role of proficiency, research in L3A was mainly concentrated on the correlation between the participants' L2 and their L3 proficiency. The present study was enlightened by Ahn and Mao (2019), which revealed supportive evidence for backward transfer from L3 Korean to L2 English in interpreting reflexive bindings with CEK L3 learners. Nevertheless, whether L2 proficiency modulated the backward transfer in their study remained unresolved. Therefore, the present study adopted the same experimental design as Ahn and Mao (2019) and manipulated the L2 levels of the participants to explore if L2-English proficiency could modulate the backward transfer in the interpretation of bindings of normal and exempt anaphors with L2 and L3 learners. Also, we examined whether the L2 proficiency has the same magnitude of effects across language groups and whether it is promotive or prohibitive in the backward transfer.

2. Literature review

Studies on reflexive bindings in L2A and L3A fields have different foci. In most generative research on L2A of reflexive bindings, scholars are primarily concerned with learning such syntactic properties as locality and orientation and/or the role of contributing factors that modulate crosslinguistic influence, such as L2 proficiency. Some others show interest in the interface between syntactic and pragmatic factors in L2 acquisition of reflexive bindings. Different from studies in L2A, attention in the field of L3A has been paid to identifying the various sources and directionality of transfer, and some other factors that influence L3 acquisition.

2.1 Proficiency in L2A of Reflexive

Whether proficiency plays a role in the development of L2A of reflexives remains a disputable issue. Hirakawa (1990) conducted experiments to examine the acquisition of syntactic properties of English reflexive with Japanese-English learners of different grades. No Proficiency tests were conducted in their experiments, and participants of different grades were presumed to represent different proficiency levels. The results provided evidence for the transference of L1 parameter setting into L2 reflexive comprehension, thus resulting in transfer errors. In addition, there was no apparent improvement over the different grade levels. The author proposed the lack of improvement in reflexive comprehension with the increasing proficiency might be attributed to the relatively low-level proficiency and inadequate exposure to English.

Dermirci (2000) found that Turkish-English L2 learners of five proficiency levels unanimously showed a stronger tendency to abide by pragmatic strategies rather than syntactic constraints in their interpretation of English reflexives when the sentences are pragmatically biased. The author concluded that there was Turkish L1 transfer of the pragmatic strategies overriding syntactic rules in selecting the antecedent in their L2. The employment of those pragmatic constraints persists despite the increasing proficiency and amount of input over time.

In a subsequent study with Korean-English L2 learners, Lee (2008) conducted experiments to explore the role of pragmatic vs. syntactic factors in determining reflexive antecedents. The results showed that the advanced L2 learners patterned similarly to the English natives in a pragmatically neutral context. In contrast, they displayed a significantly greater dependency on contextual factors than the English natives in a pragmatically biased context. Consequently, the author suggested that the L2 learners, despite their advanced proficiency level, were susceptible to transfer from their Korean L1, in which binding and locality appeared to pragmatic nature, and the binding of reflexives might not be subject to the syntactic conditions.

Sperlich (2016) compared the acquisition of Chinese reflexive *ziji* with English-Chinese and Korean-Chinese L2 learners. While proficiency modulated the progressive pattern with the EC groups, there were signs of uniformness in the KC groups of different proficiency levels. The authors attributed the two acquisition patterns to L1 transfer. English reflexive pronouns were syntactic in nature, whereas Korean reflexives, similar to Chinese ones, were pragmatic in nature. The progressive pattern of the EC groups manifested how EC learners shifted from their dependency on syntactic rules to pragmatic constraints in interpreting Chinese reflexives.

In contrast to the generally unanimous pattern across various proficiency levels in the developmental path found in the previous studies, there is positive evidence for a significant role of proficiency in some other research.

Akiyama (2002) explored the acquisition of the locality condition on English reflexives with L1-Japanese learners at five proficiency levels. In addition to analyzing the mean scores of experimental groups in locality conditions, the author also went into the consistency of the participant. Participants were classified as either consistently possessing a type of grammar or being inconsistent in their judgment, depending on whether a participant showed the same grammar for 2 or 3 out of 3 stimulus sentences. Taking advantage of combining the aggregated and consistency data, the author detected positive evidence for an early start and continued existence of the finite-nonfinite asymmetry. Furthermore, the author revealed imbalanced roles of proficiency in the developmental pattern of the restriction on LD binding. Significant progress across the five proficiency levels was present in finite conditions whereas absent in non-finite conditions.

Jiang (2009) found a clear pattern for a modulating role of proficiency in acquiring L2 locality constraints. Compared to the beginner and advanced level learners, the intermediate participants were reported to show the strongest asymmetry between finite and non-finite clauses. The advanced proficiency learners, on the other hand, showed the strongest asymmetry in LD judgments with referential/quantified antecedents.

Yoshimura, Nakayama, Shirahata, Sawasaki and Terao (2012), in their comparison between an English and a Chinese group learning L2 Japanese, found the existence of the early SD vs. delayed LD asymmetry in the acquisition of reflexive *zibun* in both groups. They conceived that the early crosslinguistic acquisition of short-distance interpretation could be pinpointed to the assumption that locality was the core notion of human cognition, and the delayed LD interpretation was due to the syntax-pragmatics interface inherent in *zibun*. The complexity of the pragmatic knowledge involved in the LD interpretation needed time for L2 learners to capture.

2.2 L3A of Reflexive

Tsang (2009) examined the acquisition of L3 Cantonese monomorphemic and polymorphemic reflexives by L1

Tagalog-L2 English participants. In the co-reference-judgment task, the L3 learners were more inclined to bind both monomorphemic and polymorphemic reflexives locally in finite clauses, and the difference was statistically significant. The same trend was also found in non-finite clauses with the L3 group. According to the author, neither the linguistic similarity between L1 Tagalog and L3 Cantonese nor L2 status could interpret the preference for local binding in both finite and non-finite clauses with the L3 group. Instead, this result could be attributed to the notion of ‘minimal distance.’ Co-indexing the reflexive with the nearest antecedent and ignoring the farther choices could help to get instant comprehension of the message.

Yoshimura, Nakayama, Fujimori and Sawasaki (2012) conducted an experiment to verify whether L3 learners reset their parameters regarding the acquisition of reflexives. The results were positive, so they moved on to look for the possible origin of the parametric value that the L3 learners reset. The experiment was designed as 4 Groups (L1 Chinese-L2 English-L3 Japanese, L1 Chinese-L2 Japanese, L1 English-L2 Japanese, and Native Japanese) * 2 Binding Type (Short Distance vs. Long Distance) * 2 Finiteness (Finite vs. Non-finite) * 2 Truth Value (True vs. False) story-based Truth Value Judgment Task. Statistics on accuracy rate indicated that the CEJ group was less accurate than the CJ group in the Short Distance binding condition. In contrast, in Long Distance binding condition, the CEJ group performed significantly better than the EJ and CJ groups but not as accurate as the NJ group. According to the authors, these results could not be interpreted satisfactorily by the parameter resetting view. L1, rather than L2, played a positive role in L3 acquisition of reflexive binding. The better performance of the L3 group in the LD binding condition could be attributed to their enhanced linguistic sensitivity to and a better understanding of a particular syntactic-pragmatic constraint.

Yoshimura, Nakayama, Sawasaki, Fujimori and Kahraman (2012) compared the acquisition of Japanese reflexive *zibun* with two L2 groups (English-Japanese and Chinese-Japanese) and two L3 groups (Chinese-English-Japanese and Turkish-English-Japanese). They hypothesized that the EJ group would have difficulties in LD binding acquisition, whereas the CJ group would not, and that the two L3 groups would have difficulties as well since their L2 English allowed only for short-distance binding. Their data partially supported the hypothesis that the two L2 groups and the TEJ group showed clear asymmetry between SD and LD in the True conditions. Conspicuously, the CEJ group performed equally well in SD and LD conditions, with no significant difference from the Native Japanese group. They concluded that locality was the core notion underlying language acquisition. Thus, LD was generally delayed relative to SD reflexive acquisition. L1 didn't play an essential role in the L2 or L3 acquisition of long-distance anaphor binding. L3 acquisition could enhance learners' linguistic sensitivity.

In this study, and previous ones, Yoshimura et. al. employed a story-based Truth Value Judgment Task. Participants from different L1 backgrounds read narrations in their L1 and decided the truth value of the testing sentences, which were always in Japanese. The juxtaposing of L1 and the target Japanese in this way may risk inducing transfer from L1. Furthermore, the L2 and L3 proficiency were not strictly controlled for, which might be confounding factors for the inconsistent results in binding accuracy rates.

2.3 Proficiency and Backward Transfer in L3A

Among the burgeoning research on backward transfer from L3 to L2 and/or L1, the studies of Tsang (2015a, 2015b) explored the modulating role of proficiency in this process. Tsang (2015), in a survey of the perceived linguistic distance between L1 Cantonese and L2 English, found that L3 proficiency played a modulating role. Specifically, the L1 Cantonese-L2 English-L3 French group performed similarly to the L1 Cantonese-L2 English group in rating the similarities and differences between Cantonese and English. The mean scores of both groups were equally low, indicating a perceived significant linguistic difference between the two languages. But when the

L3 group was further divided into three groups based on their L3-French proficiency, the L3-high groups scored significantly lower than the L3-mediate and L3-low groups and the L2 groups. Furthermore, among all the groups, the L3-high group provided the most specific comments in the following open-up question on the similarities between English and Cantonese. Combined, these results indicated that the L3-high group was more prone to the linguistic similarities/differences between their L1 and L2, and the greater sensitivity was attributed to their enhanced cross-linguistic experience.

In another research on the English number agreement among L3 learners, Tsang (2015) found a possible reverse transfer from L3 French to L2 English among the Cantonese-English-French participants, using a grammaticality judgment-correction task and a free writing task. The comprehension task didn't yield clear sign of transfer, but the production data revealed a salient discrepancy between the CE and CEF group. While the CE group produced significantly more ungrammatical missing '-s' forms than ungrammatical redundant '-s' forms, the CEF group seemed to neutralize the difference between the two non-target-like plural forms. The author postulated that the L3 French with a more robust morphological marking greatly enhanced participants' sensitivity to morphological plural marker, which enabled them to miss the plural '-s' form less frequently. In addition, when L3 French proficiency was considered, the CEF-H and CEF-M subgroups showed no statistical difference between missing '-s' forms and redundant '-s' forms, whereas the CEF-L sub-group displayed a similar pattern as the CE group. The author took it as evidence for a modulating role of L3 proficiency in reverse transfer. In particular, the transfer effect from L3 French to L2 English could only occur when a learner's L3 proficiency reached a threshold.

3. Methodology and Procedure

Adopting the same experimental design as that used in Ahn and Mao (2019), the present study enrolled participants of CE, CEK, and KE language configurations and classified each group into high- and low-proficiency levels. The participants completed the Cambridge Quick Placement Test, the story-based Truth Value Judgment Task (TVJT), and the questionnaire on their linguistic background.

3.1 Participants

One hundred and twenty native Chinese undergraduates (42 male, 78 female; average age = 19.5) were recruited and tested at a university in Shandong Province of China. All participants reported starting to learn English in primary school (Average Age of Acquisition = 8.65). None of the participants reported having any experience learning English outside the classroom setting in China. Seventy-three of them (CE) majored in Electronics and Communications Engineering and reported having no prior experience with the Korean language. Forty-seven from the Korean language department were in their first or second year of learning Korean as the L3 (CEK, average Korean AOA = 18.11). Additional credits and small gifts were provided for their participation upon completion.

Forty-four native Korean undergraduates (KE) were recruited and tested at a university in Seoul, Korea (10 male, 34 female; freshmen). The reported average AOA of English was 8.26. None of them had any experience of learning English outside the classroom setting in Korea, nor any experience of learning a third language, according to the linguistic background survey.

3.2 Materials and Procedures

The present experiment exploited the same materials and procedures as the one used in Ahn and Mao (2019). All three groups completed the Cambridge Quick Placement Test, the story-based Truth Value Judgment Task (TVJT), and the linguistic background questionnaire. All tests were off-line and were taken in classroom settings. Instructions for the three tests were provided in English. There was no time limit and participants were asked to complete the items as fast and accurately as possible.

4. Results

The present experiment intended to explore the possible role of L2-English proficiency in the interpretation of reflexive bindings with CE, CEK, and KE groups. The scores in the Cambridge Quick Placement Test (Version 2) were used to stratify the participants from each group into High- and Low-proficiency levels.

4.1 Classification of High- and Low-proficiency Levels

Descriptive statistics of L2 Scores were extracted with SPSS to decide the cutting line between High- and Low-proficiency levels (Table 1).

Table 1. Descriptives of English Proficiency Scores

Groups		CE	CEK	KE
Number	Valid	73	47	44
	Missing	0	0	0
Mean		29.85	31.77	38.20
Median		30.00	32.00	38.00
Minimum		18	23	12
Maximum		39	41	52

As is shown in Table 1, there was no missing value across the CE, CEK, and KE groups about the L2 Scores. To explore the possible role of L2 proficiency on the interpretation of reflexive bindings with participants on different proficiency levels, participants of each language group were classified into low- and high-proficiency sub-groups, using the respective medians (Median (CE) = 30, Median (CEK) = 32, Median (KE) = 38) as cutting lines. The purpose of making the classification in this way was to keep the number of the cases balanced in the low and high-proficiency levels within each language group. The results of the classification based on the L2 Scores were displayed in Figure 1 below.

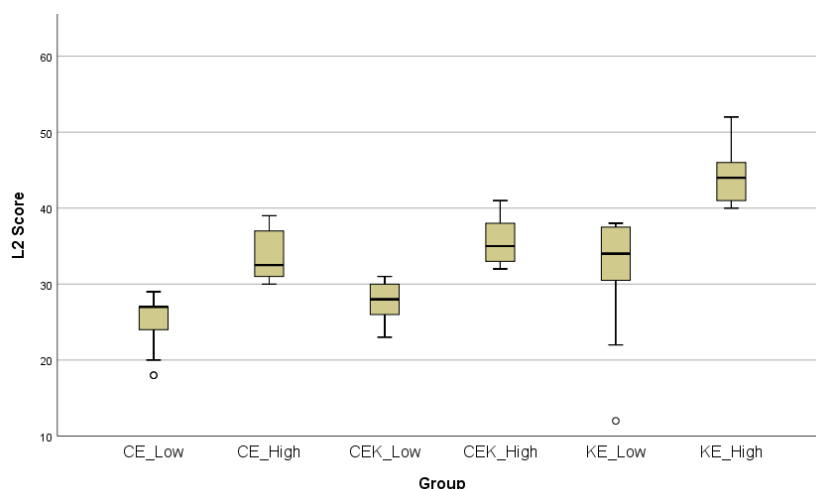


Figure 1. L2 Scores of High- and Low-proficiency Levels

4.2 L2 Scores and D-Prime Scores in TVJT

Table 2 reported the results of the classification of proficiency levels, including the number of participants on the high- and low-proficiency levels with the CE, CEK, and KE groups, as well as the descriptive data on their L2 Scores and D-Prime Scores¹ in the TVJT.

Table 2. Results of L2 Scores and D-Prime Scores

Variable	L2 Level	Number	Mean	Min	Max	Std. Deviation	Std. Error Mean
L2 Scores	CE_Low	33	25.45	18	29	3.103	.540
	CE_high	40	33.48	30	39	2.996	.474
	CEK_Low	22	27.68	23	31	2.607	.556
	CEK_High	25	35.36	32	41	2.737	.547
	KE_Low	23	32.57	12	38	6.515	1.358
	KE_High	21	44.38	40	52	3.827	.835
D-Prime Scores	CE_Low	33	.9066	.00	2.35	.53999	.09400
	CE_high	40	.9206	.00	2.06	.47781	.07555
	CEK_Low	22	.8670	.21	1.64	.43431	.09259
	CEK_High	25	.9418	.21	2.40	.69573	.13915
	KE_Low	23	.8435	-.42	1.64	.50022	.10430
	KE_High	21	1.2914	-.97	3.11	1.18367	.25830

Three Independent-samples t-tests with L2 Level as the independent variable, and L2 Scores and D-Prime Scores as the dependent variables were conducted with the CE, CEK, and KE groups, respectively. The purposes of the analyses were to confirm a significant difference in the L2 Scores between the High and Low-Proficiency levels and to examine significant differences in the D-Prime Scores of reflexive bindings between the two L2

¹ As an index of discrimination accuracy, D-prime scores (D’s) were calculated based on the proportion of “hits” obtained for each contrast and the proportion of “false alarms” (Macmillan and Creelman 1991).

levels within the CE, CEK, and KE participants.

Table 3. T-tests Results of L2 Scores and D-Prime Scores

Proficiency Groups	vs.	Dependent Variables	Levene's Test for Equality of Variances		<i>t</i>	<i>df</i>	<i>Sig.</i> (2-tailed)	Mean Difference	Std. Error Difference
			<i>F</i>	<i>Sig.</i>					
CE_Low	vs.	L2 Scores	.260	.612	-11.202	71	.000	-8.020	.716
		CE_High	D-Prime Scores	.627	.431	-.118	71	.906	-.01409
CEK_Low	vs.	L2 Scores	.013	.908	-9.811	45	.000	-7.678	.783
		CEK_High	D-Prime Scores	4.318	.043	-.447	40.815	.657	-.07478
KE_Low	vs.	L2 Scores	2.812	.101	-7.244	42	.000	-11.816	1.631
		KE_High	D-Prime Scores	12.876	.001	-1.608	26.416	.120	-.44790

The results in Table 3 reaffirmed the significant differences in L2 Scores between the High- and Low-Proficiency levels within each group (Figure 1). It was showed that within CE, the difference in L2 Scores between the CE_Low ($M = 25.45, SD = 3.103$) and the CE_High ($M = 33.48, SD = 2.996$) was significant ($t(71) = -11.202, p = .000$), while the numeric difference of D-Prime Scores between the former ($M = .9066, SD = .53999$) and the latter ($M = .9206, SD = .47781$) did not reach a significant level ($t(71) = -11.202, p = .000$). Similarly, the CEK_Low ($M = 27.68, SD = 2.607$) scored significantly lower than the CEK_High ($M = 35.36, SD = 2.737$) in the L2 Scores ($t(45) = -9.811, p = .000$), but not in the D-Prime scores ($t(45) = -.447, p = .657$), in spite of the numeric difference between the CEK_Low ($M = .8670, SD = .4343$) and the CEK_High ($M = .9418, SD = .6957$) levels. The KE group displayed the most conspicuous numeric discrepancy in the L2 scores and D-Prime Scores between the Low and High proficiency levels. The mean L2 score of the KE_Low ($M = 32.57, SD = 6.515$) was significantly lower ($t(42) = -7.244, p = .000$) than that of the KE_High ($M = 44.38, SD = 3.827$), whereas the difference in their D-Prime Scores was not meaningful statistically ($t(42) = -1.608, p = .120$), with the KE_Low ($M = .8435, SD = .5002$) being lower than the KE_High ($M = 1.2914, SD = 1.1837$) (Figure 2).

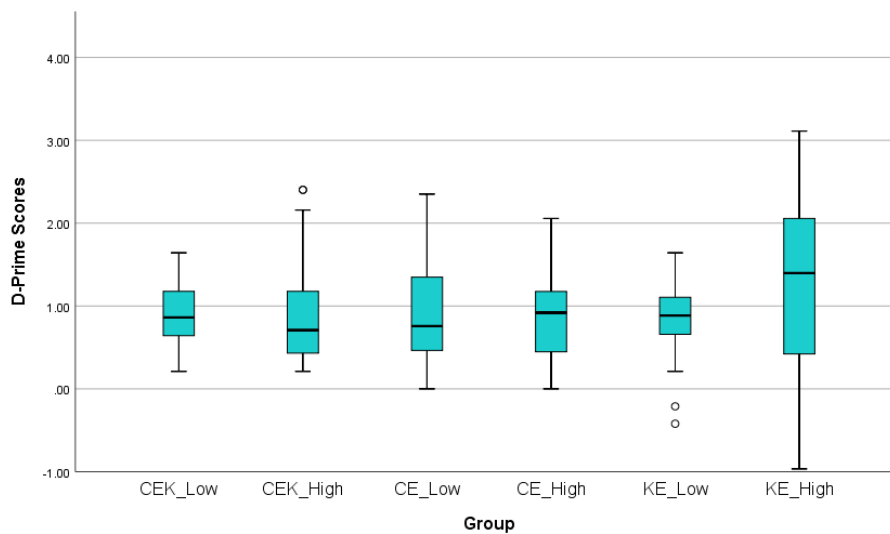


Figure 2. D-Prime Scores of Low- and High-Proficiency Levels across the Groups

4.3 D-Prime Scores in SD and LD Binding Conditions

In Ahn and Mao (2019), the comparison of the accuracy rate of reflexive bindings in SD and LD conditions yielded imbalanced patterns with the CE, the CEK, and the KE groups. The KE displayed a significantly higher accuracy rate in SD than in LD conditions. The CEK produced a marginally significant discrepancy, whereas the CE did not differ in the accuracy in interpreting reflexives in SD and LD conditions.

Since the asymmetry between SD and LD binding conditions was only detected with the KE group, and the KE group was significantly higher in their L2 scores than the CEK and the CE groups, it was worth considering if L2 proficiency level played a role in determining the existence of the SD-LD asymmetry.

The same method of calculating the D-Prime scores was adopted to get the D-Prime scores in SD (SD_D-Prime) and LD (LD_D-Prime) conditions separately with participants of the High- and Low-Proficiency levels in the CE, the CEK and KE groups (Table 4).

Table 4. Results of SD_D-Prime Scores and LD_D-Prime Scores

Variable	L2 Level	Number	Mean	Minimum	Maximum	Std. Deviation	Std. Error Mean
SD_ D-Prime Scores	CE_Low	33	.7015	-0.95	2.77	.89301	.15545
	CE_high	40	.9419	-0.97	2.77	.84133	.13303
	CEK_Low	22	.8266	-0.97	2.77	1.04480	.22275
	CEK_High	25	1.0340	-0.43	2.77	.95817	.19163
	KE_Low	23	.8186	-0.97	2.35	.82362	.17174
	KE_High	21	1.3490	-0.43	2.77	1.10224	.24053
LD_ D-Prime Scores	CE_Low	33	1.0982	-0.54	2.35	.75397	.13125
	CE_high	40	.8259	-0.97	1.93	.63396	.10024
	CEK_Low	22	.9031	-0.43	1.93	.60950	.12994
	CEK_High	25	.7419	-0.43	1.93	.55713	.11143
	KE_Low	23	.8156	-0.86	1.93	.78921	.16456
	KE_High	21	1.0024	-1.93	2.77	1.26761	.27662

The descriptive data in Table 4 revealed that in SD binding condition, the two proficiency levels from the CE, the CEK, and the KE groups displayed a unanimous tendency that the High-proficiency levels tended to have higher absolute values in D-Prime scores than the Low-Proficiency levels. In particular, the discrepancies in the mean scores between the CEK_Low- ($M = .8266$, $SD = 1.045$) and the CEK_High-Proficiency ($M = 1.034$, $SD = .958$) levels, those between the CE_Low- ($M = .7015$, $SD = .893$) and CE_High-Proficiency ($M = .9419$, $SD = .841$) levels, and those between the KE_Low- ($M = .8186$, $SD = 1.349$) and the KE_High- ($M = 1.349$, $SD = 1.102$) levels were in an increasing order.

Unlike patterns in the SD binding condition, the LD condition saw two contradictory tendencies. The CE_Low ($M = 1.0982$, $SD = .754$) and the CEK_Low ($M = .9031$, $SD = .609$) got higher D-Prime scores than their correspondents on the CE_High ($M = .8259$, $SD = .634$) and CEK_High ($M = .7419$, $SD = .557$) proficiency levels. In contrast, the KE_Low ($M = .8156$, $SD = .789$) scored lower than the KE_High ($M = 1.0024$, $SD = 1.268$) in their binding interpretation in the LD condition.

Three Independent-samples t-tests with L2 Level as the independent variable and D-Prime Scores in SD and LD binding conditions as the dependent variables were conducted with the CE, CEK, and KE groups respectively (Table5).

Table 5. T-tests Results of SD_D-Prime and LD_D-Prime Scores

Proficiency Groups	Dependent Variables	Levene’s Test for Equality of Variances		<i>t</i>	<i>df</i>	Sig. (2-tailed)	Mean Difference	Std. Error Difference
		F	Sig.					
CE_Low vs. CE_High	SD_D-Prime Scores	.647	.424	-1.182	71	.241	-.24039	.20342
	LD_D-Prime Scores	1.443	.234	1.677	71	.098	.27231	.16241
CEK_Low vs. CEK_High	SD_D-Prime Scores	.000	.995	-.710	45	.481	-.20740	.29219
	LD_D-Prime Scores	.047	.830	.948	45	.348	.16126	.17018
KE_Low vs. KE_High	SD_D-Prime Scores	3.435	.071	-1.818	42	.076	-.53038	.29167
	LD_D-Prime Scores	2.971	.092	-.592	42	.557	-.18677	.31532

As is shown in Table 5, the differences in the SD_D-Prime scores were only marginally significant between the KE_Low and KE_High ($t(42) = -1.818, p = 0.076$) levels, but not meaningful between the CE_Low and CE_High ($t(71) = -1.182, p > .05$) and the CEK_Low and CEK_High ($t(42) = -.710, p > .05$) levels. In the LD binding condition, the differences in the D-Prime scores between the low and high proficiency levels with the CE ($t(71) = 1.677, p > .05$), the CEK ($t(42) = .948, p > .05$), and the KE ($t(42) = -.592, p > .05$) groups were not statistically significant.

Paired-samples t-test was conducted to explore whether there were within-level differences between the D-Prime Scores in SD and LD binding conditions with the CE, the CEK, and the KE groups (Figure 3).

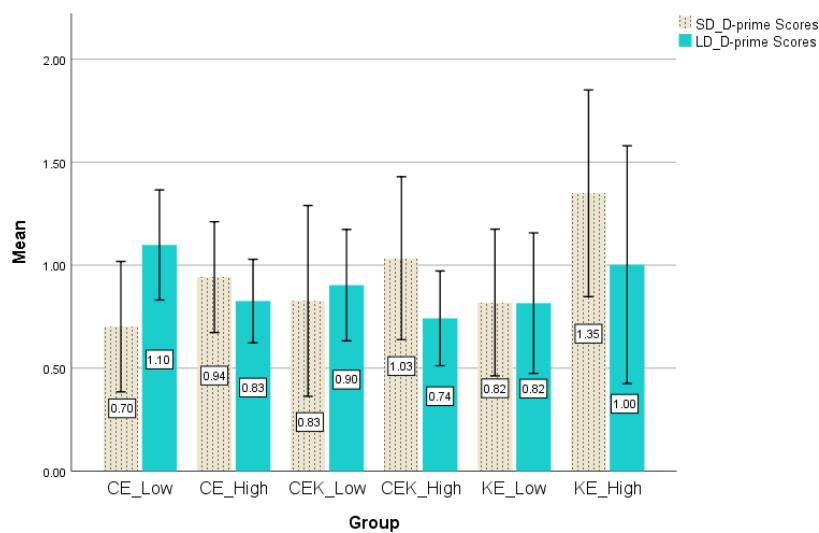


Figure 3. SD_D-Prime and LD_D-Prime Scores Within Proficiency Levels

Numeric differences were found between SD_D-Prime and LD_D-Prime Scores within each proficiency level except for the KE_Low level being equal in the SD and LD conditions. However, none of the numeric difference was statistically meaningful.

Generally speaking, the KE_Low level made exactly the same D-Prime scores in the SD and LD conditions, followed by the CEK_Low level, which scored slightly higher in LD than in the SD condition. The CE_Low level was conspicuously higher in the LD_D-Prime score. The high-proficiency levels displayed a more unanimous tendency, with the SD_D-Prime scores being higher than the scores in the LD condition. Furthermore, the mean difference in the D-Prime scores between the two binding conditions was the smallest with the CE_High level and the greatest with the KE_High level, with the CEK_High level in between.

5. Discussion

The present experiment classified the participants from the CE, the CEK, and the KE groups into two levels based on the medians of scores in the Cambridge Quick Placement Test. Since the three language groups yielded different medians in their L2 scores, the cutting lines between the low and high-proficiency levels were not comparable across language groups. Being concentrated on the potential role of L2 proficiency in the interpretation of reflexive bindings, the comparisons concerned with the D-Prime scores, the SD_D-Prime scores and the LD_D-Prime scores were made between the two proficiency levels within language groups. No direct cross-group comparisons were conducted.

In spite of the significant differences in the mean scores of general L2 proficiency between the Low- and High-Proficiency levels within each of the three groups, the differences in the mean D-Prime scores of reflexive binding interpretations were not proven to be significant. This result to some extent reinforced what Berkes and Flynn (2012) had elaborated in their study on the acquisition of relative clauses with L2 and L3 learners. They concluded that the construction of the target grammar of relative clauses followed a specific developmental process which was proven to be common to learners of various language backgrounds. Nevertheless, the specific process of constructing the target grammar did not necessarily reflect a measurable proficiency level in the traditional sense. In the present experiment, the significant differences in the L2 proficiency levels measured by the Cambridge Quick Placement Test did not register significant differences in the general accuracy rate of the interpretation of reflexive bindings. The same results of insignificant differences between the low and high proficiency levels held true when accuracy rates in the SD binding of normal anaphors and LD binding of exempt anaphors were extracted and compared separately.

Taken together, the results in the present experiment seemed to indicate that the subtle process by which the learners construct the specific grammar of reflexive binding was not congruent with what Yoshimura et al. (2012) concluded. In their study, the participants who were learning reflexive *zibun* in Japanese as L2 were found to be more accurate in SD conditions at an early stage, while the acquisition of LD binding lagged far behind. They conceived that the crosslinguistic early acquisition of short-distance interpretation could be pinpointed to the assumption that locality was the core notion of human cognition, and the delayed LD interpretation was due to the syntax-pragmatics interface inherent in *zibun*. The complexity of the pragmatic knowledge involved in the LD interpretation needed time for L2 learners to capture.

As is shown in the present experiment, there appeared to be a different sequence of development with the L2 learners whose L1s allowed for long-distance binding. The participants of the CE and the KE groups in our experiment did not seem to start with the apparent advantage of being more accurate in the SD binding of normal-anaphor interpretations. In contrast, the KE group made a roughly equal number of correct answers in the SD binding of normal anaphors and LD binding exempt of anaphors, and the CE group manifested a numerically higher accuracy rate in the LD than in the SD binding in the initial stage of learning the specific property of binding.

In the later path of learning, the participants gradually established the competence of allowing only SD binding for normal anaphors and becoming more accurate in the interpretation of SD binding anaphors henceforth. In the meanwhile, the disallowing for non-local interpretation of normal anaphor seemed to be over-generalized to the interpretation of LD exempt anaphors on the part of the CE group, resulting in a numeric decrease in the accuracy rate of LD binding interpretations. The KE group displayed a numeric increase in the scores of their interpretation of both the SD and the LD binding conditions, but in an unparallel manner. The rising line in the accuracy of normal anaphors interpretation was steeper than that of the exempt anaphors.

The CEK L3 group whose L1 Chinese and L3 Korean both had LD reflexives revealed a more nuanced picture. Reading from the descriptive data, the L3 participants were slightly better in the interpretation of the long-distance bound exempt anaphors at the initial stage, which was different from both the CE group with a larger discrepancy and the KE group which saw a paralleled accuracy rate in the normal and exempt anaphors. With the development of constructing the property of English anaphor binding, the CEK group seemed to benefit from their enhanced knowledge of the target grammar of reflexive bindings in their experience of learning an additional L3 Korean. It was in line with what Berkes and Flynn (2012) had found, to the extent that syntactic knowledge acquired in the course of learning more languages does not simply add up but rather has a multiplying effect on further language learning. Nevertheless, different from their findings, the CEK group in the present experiment did not achieve considerable progress in the interpretation of the long-distance bound exempt anaphors. On the contrary, there seemed to exist a detrimental effect on the acquisition of LD binding interpretation, which could not be explained within the framework of *the Cumulative Enhancement Model*.

Literally, there seemed to be a tendency for participants of the three groups to show a steeper rising line in the process of acquiring the interpretation of locally bound normal anaphors, and a relatively lagged behind progress with the non-locally bound exempt anaphors. We contemplated that the relatively lower accuracy in the interpretation of exempt anaphors might be attributed to a higher degree of sentence complexity on the one hand, and the nature of involving syntactic and pragmatic interface on the other hand, as was proven by Dermirci (2000), Lee (2008), Yoshimura et al. (2012), and Sperlich (2016). It was necessary to carry out an in-depth analysis of the stimuli with regard to the interpretation of non-locally bound exempt anaphors to see if sentence complexity and such pragmatic factors as congruency in gender, number, or animacy might have a role in the acquisition of reflexive bindings.

6. Conclusion

The present study explored the potential role of L2 proficiency on the interpretation of L2 reflexive bindings with the CE, the KE, and the CEK groups. The results did not lend support to a robust role of L2 proficiency, which reinforced the conclusion in Ahn and Mao (2019) that the better performance of the KE than the CEK in the TVJT was less likely to be influenced by the significant difference in their L2 scores. The developmental path towards the target grammar of reflexive binding was not reflected by the general proficiency measured in traditional ways. For learners whose L1, L3, or both L1 and L3 allow for non-local binding, the starting point in acquiring L2 reflexive binding was not necessarily the preference for short-distance binding. The persistent difficulty in learning the non-locally bound exempt anaphors might be due to the interwinding of syntactic and pragmatic elements, which required further inspection of the sentence complexity and congruency between the potential NPs and the anaphors constituting binding relations in the stimuli.

Despite the endeavor in exploring the modulating role of L2 proficiency, there are limitations in the methodology

of the present study. First, in terms of L2 proficiency, the experiments did not compare the data of learners who were on a low or advanced level across different language groups, due to the fact that the number of participants on the low and advanced levels was small and imbalanced across the CE, the CEK, and the KE groups. Enrolling a comparable number of participants on different proficiency levels and making multifaceted comparisons within and across the groups may provide a full-scale account of the role of proficiency in modulating the backward transfer from the L3.

Second, the study did not conduct the L3 proficiency test with the L3 group and labeled them as low-to-intermediate learners based on their self-report of the AOA of L3. The exposure to and frequency of use of L3 was under control, since the participants were from two classes in the same university, whereas the potential variance in their L3 proficiency might blur the pattern of backward transfer to their L2A. It was advisable that future studies involve an L3 proficiency test and sub-divide participants to explore possible variance in the phenomenon of backward transfer.

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Examples in: English

Applicable Languages: English

Applicable Level: Tertiary