

Cross-script L2-L1 Noncognate Translation Priming Effect: A Linear Mixed-Effects Analysis

Abstract

How translation equivalents — words that share the same meaning in two languages — are processed in bilinguals' mind is a fundamental yet unanswered question in studies of the bilingual lexical representation. Previous literature has reported conflicting results on L2-L1 translation priming effect. Nakayama, Ida and Lupker (2016) suggested that higher L2 proficiency is a strong predictor of significant L2-L1 translation priming effect. However, recent work shows that L2-L1 priming effect is robust even in unbalanced Korean-English bilinguals with low English proficiency (Lee, Jang, & Choi, 2018). The present study further investigates this question in unbalanced Chinese-English bilinguals with both ANOVA and linear mixed-effects analysis. Masked translation priming paradigm with a lexical decision task was used. The SOA consisted of 50 ms prime duration and 100 ms backward mask. Totally 60 participants were recruited and grouped into high and low English proficiency group. Critical stimuli were 52 pairs of disyllabic, noncognate Chinese-English translation equivalents. Generally, both groups completed the LDT faster in translation equivalent trials (see table 1. for mean reaction time). Results from ANOVA showed that L2-L1 translation priming effect was significant in high proficiency group (see table 2. for detailed results). By adding three random factors (i.e., participant, trial, accuracy of previous trial), linear mixed-effects analysis showed that L2-L1 priming effect was null in both groups (see table 3. for detailed results). A possible explanation is that ANOVA cannot fully capture the individual differences between participants that may confound the results. Hence, mixed findings here suggest that whether L2-L1 priming effect is robust or not depends on different statistical analysis approach as well.

Table 1. Mean reaction time (ms) of high and low English proficiency group in two conditions (translation equivalent and unrelated word).

	Translation equivalents	Unrelated words	Priming size
High proficiency group	520	543	+23
Low proficiency group	539	548	+9

Table 2. ANOVA results of high and low English proficiency group in translation equivalent condition.

	Df	F value	Pr(>F)
High proficiency group	1	4.109	0.0434*
Low proficiency group	1	1.905	0.168

Table 3. Linear mixed-effects analysis of high and low English proficiency group.

High proficiency group	Estimate	Std.Error	df	t value	Pr(> t)
Condition(unrelated)	0.03075	0.02304	49.75797	1.335	0.188
Low proficiency group	Estimate	Std.Error	df	t value	Pr(> t)
Condition(unrelated)	0.01296	0.01923	46.48450	0.674	0.504

References

Lee, Y., Jang, E., & Choi, W. (2018). L2-L1 Translation Priming Effects in a Lexical Decision Task: Evidence From Low Proficient Korean-English Bilinguals. *Frontiers in Psychology*, 9, 267.

Nakayama, M., Ida, K., & Lupker, S. J. (2016). Cross-script L2-L1 noncognate translation priming in lexical decision depends on L2 proficiency: Evidence from Japanese–English bilinguals. *Bilingualism: Language and Cognition*, 19(5), 1001-1022.