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Effects of Multiple-Choice Glosses & Frequency on L2 Academic Vocabulary Learning in Korea[*]

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ABSTRACT

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The study investigated the effects of multiple-choice glosses (MCGs) (L1 and L2) and frequency on academic vocabulary learning. Twelve college students in Korea participated in the within-samples study. The paired-samples t-statistics showed the significant learning gains between pre-test and post-test after the provision of MCGs during reading. However, the lower level students significantly improved from pre-test to post-test with L1 MCGs, not with L2 MCGs, while the advanced level more benefited from L2 MCG ($p < .01$) than L1 MCGs ($p < .05$). The results of the frequency showed that the development of the new words required at least 6 times regardless of types of gloss languages. The theoretic and pedagogical discussions were made at the conclusion.

KEYWORDS

1. Introduction

There has been a great awareness of the important role of academic vocabulary for the success in school (Nagy and Townsend 2012). The current research showed positive effects of the intervention on L2 vocabulary acquisition (Gablasova 2014, Grim 2008, Joe 2010, Jozwik and Douglas 2017, Nagy and Townsend 2012, Roling 2017). As Peters, Hulstijn, Sercu, and Lutjeharms (2009) pointed out, the successful intervention on L2 vocabulary acquisition in reading depended on discovering the meaning of unfamiliar words through glossing; elaborate processing of the meaning; and reinforcement through repetition. Significant branches of research have investigated the effects of glossing (Ko 2012, 2017, Yanagisawa, Webb and Uchihara 2020) and frequency (Choi 2016, Hulstijn, Hollander and Greidanus 1996, Zhao and Ren 2017) on L2 vocabulary learning.

The acquisition of academic vocabulary has been explored extensively in the second language or content-based language programs (Eckerth and Tavakoli 2012, Gablasova 2014, Joe 2010, Jozwik and Douglas 2017, Nagy and Townsend 2012). However, there has been little research conducting in the foreign language learning context though general vocabulary learning has been studied a lot in these contexts (Choi 2016, Hulstijn, Hollander and Greidanus 1996, Ko 2017, Yanagisawa et al. 2020, Zhao and Ren 2017). The current study examines the effects of glossing and frequency on academic vocabulary learning in Korean EFL college contexts.

2. Literature Review

There were a lot of studies on the effects of glossing on L2 vocabulary acquisition from incidental reading. According to the recent meta-analysis of Yanagisawa et al. (2020), glossed reading led to significantly greater learning of words than nonglossed reading. As far as the types of glosses were concerned, multiple-choice glosses were the most effective, and in-text glosses and glossaries were the least effective gloss types. In terms of language types, L1 plus L2 led to the highest gain followed by L1, and L2 glosses. They did not find any interaction between language (L1 vs. L2) and proficiency (beginner, intermediate, or advanced), and no significant difference among modes of glossing (textual, pictorial, or auditory).

Watanabe (1997) compared three effects of word explanation (appositives, marginal glosses, and multiple choice marginal glosses) on the acquisition of the targer words. He found the participants in single and multiple-choice marginal gloss conditions outperformed those in the no cue and the appositive conditions, but that there existed no statistically significant difference between the participants in the single and the multiple-choice gloss conditions. On the other hand, Rott (2005) found the different results about the effects of single-translation and multiple-choice glosses on L2 vocabulary learning. L2 learners read an enhanced text, where the target words appeared three more times in the text than the others, in the two conditions, multiple-choice glosses (MCGs) and single-translation glosses (STGs). The results showed that MCGs may lead to more vocabulary acquisition and text comprehension than STGs.

Rott, Williams and Cameron (2002) investigated the effect of three conditions on lexical acquisition and retention such as L1 multiple-choice glosses, text reconstruction in L2 with chances to recheck input, and combined treatments. The results showed that the multiple-choice gloss treatment resulted in more significantly productive and receptive word gains in the post-test right after the treatment, but that the combined treatment condition only led to a significant receptive word gain after five weeks.

Ko (2012) investigated the effects of three types of glosses on L2 vocabulary acquisition in Korea: No gloss, LI gloss, and L2 gloss. The findings showed that a significant difference appeared between no-gloss and glossed conditions but that there were no significant differences between LI and L2 gloss conditions on both the immediate and delayed posttests. However, the participants preferred L2 glosses over L1 glosses on the survey. Ko (2017) further examined the relationship between L2 proficiency and four types of glosses (no-gloss, L1 gloss, L2 gloss, and L1 plus L2 gloss). Korean university students were asked to read passages, complete an immediate vocabulary test and a survey, and take a delayed vocabulary test after four weeks. The findings showed that the L1 gloss and the L1 plus L2 gloss were effective for low levels while the L2 gloss and the L1 plus L2 gloss, effective for high levels and that the L1 plus L2 gloss type was the most preferred one of the participants.

Hulstijn, Hollander and Greidanus (1996) compared retention of new words in three conditions: Marginal glosses (with L1 translations of unknown words), Dictionary (using a bilingual dictionary), or Control with two frequency conditions (once vs. three times). The findings showed that frequency of occurrence fostered incidental vocabulary learning more with marginal glosses or a dictionary. Choi (2016) further studied the effects of the frequency of the target words on vocabulary learning with L1 and L2 gloss: words appearing twice (F2 words) and four times (F4 words). He found that there was no difference between L1 and L2 groups in the short-term memory of the F2 and F4 words, but that the L1 group performed better than the L2 group in the long-term memory of F4 words, but not in that of F2 words.

Zhao and Ren (2017) also investigated the effects of L2-gloss frequency and learner proficiency of Chinese university students on incidental L2 lexical acquisition: No gloss (NG), High frequency L2 gloss (HFLG), and Low frequency L2 gloss (LFLG). The findings showed that the glossed groups significantly outperformed the non-glossed group in immediate recall and recognition. The gloss advantage, however, retained in delayed recognition only, not in delayed recall. In addition, the gloss frequency effect occurred with lower proficiency participants only, who favoured HFLG because of easy encoding and better comprehending.

On the other hand, scholars became to be well-aware of the importance of academic vocabulary for students' school success because it offers bridges to students to help them study academic contents or subjects. Nagy and Townsend (2012) defined academic language as "the specialized language, both oral and written, of academic settings that facilitates communication and thinking about disciplinary content" (p. 3). They suggest that teachers should teach academic vocabulary before teaching contents or subjects.

Gablasova (2014) studied the specialized vocabulary acquisition from L1 and L2 textbooks by sixty four Slovak high school intermediate or advanced students studying English. The results showed that the L2-instructed students recalled fewer word meanings after the reading and they acquired the words

to a lesser depth as well. After a week their knowledge of the words disappeared more rapidly than that of the other participants. This indicates that L1 or bilingual instruction could play a more significant role in the acquisition of the specialized vocabulary.

Others studied academic vocabulary acquisition through word definition or glosses (Jozwik and Douglas 2017) and word frequency (Eckerth and Tavakoli 2012, Joe 2010). Jozwik and Douglas (2017) discovered that the academic vocabulary intervention helped English learners studying in academic settings to improve their abilities define the academic words. Joe (2010) also showed the beneficial role of frequency in academic vocabulary acquisition. Eckerth and Tavakoli (2012) further examined the differential effects of frequency and elaborate word processing on L2 vocabulary learning. The results showed similar effects for both variables on initial word acquisition, but the subsequent word retention was more contingent on elaborate word processing of form and meaning relationships than on word frequency.

3. Method

3.1 Participants and Research Questions

Twelve students majoring in English Language and Literature at a university, Seoul, took part in this study in spring semester, 2021. Their TOEIC scores ranged from 750 to 970 except four students who have not taken the test before). The present study took the within-samples experiment and addressed the effects of multiple-choice glossing in L1 (Korean) and L2 (English) on academic vocabulary learning. The study aims to answer the following questions:

(1) Are there any positive effects of (L1 and L2) multiple-choice glosses on academic vocabulary learning?
(2) Are there any differences between the effects of (L1 and L2) multiple-choice glosses on academic vocabulary learning of two proficiency levels?
(3) Does the frequency of target vocabulary influence its learning?

3.2 Research Design

For the study, the researcher conducted the zoom conference online. First of all, the researcher chose a reading text from the academic reading text (Grundy 2008) (See Appendix). Then, eight target words and five distracters were selected from the reading text by the researcher and then the participants were pre-tested before treatment and post-tested right after treatment.

The half of the target words were divided into two types of glossing: L1 and L2 multiple-choice glosses (4 words per each), as shown in Figure 1 below. When they find the target words reading the text, they can see either L1 or L2 multiple-choice items with the first click on it and then find the answer with the second click, as shown in Figure 1. The target words appeared once (2 words), twice

(1 word), 3 times (2 words), 4 times (1 word), or 6 times (2 words) after being offered multiple-choice glosses.
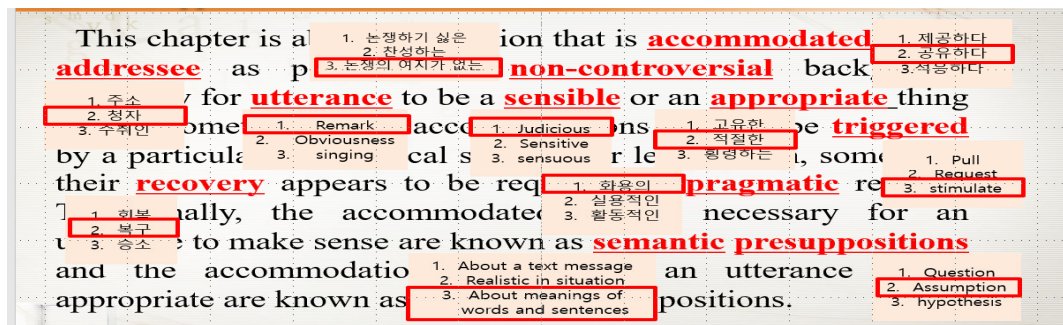

Figure 1. Multiple-Choice Glosses

The vocabulary test was developed by the researcher following Ko (2012). The multiple-choice test (8 target words and 5 distracters) consisted of seven L1 and eight L2 versions to control the effects of language types. Each multiple-choice item had four options: one answer and three distracters. For example, for the target word, presupposition, the participants were asked to choose one among the four choices: (a) question (b) assumption (d) inference and (d) hypothesis. It took about 30 minutes for the reading task and then the post-test was given right after that.

4. Results

4.1. Effects of Glossing on Vocabulary Learning

The following descriptive statistics in Table 1 showed the vocabulary scores of the pre-test and the post-test of the within-samples experimental group. For example, the pre-test mean score of the participants was 3.5 out of the total score (8), and then their post-test mean score was 6.08 after the experiment. For each of the L1 and L2 multiple-choice glosses (MCGs), their pre-test mean scores were 2.0 and 1.5, and their post-test mean scores were 3.67 and 3.42 respectively, as shown below.

Table 1. Descriptive Statistics

Glossing	Paired Samples	*Mean*	*N*	*SD*
MCGs in total	Pretest	3.5	12	.40
	Posttest	6.08	12	.45
L1 MCGs	Pretest	2.0	12	.17
	Posttest	3.67	12	.19
L2 MCGs	Pretest	1.5	12	.31
	Posttest	3.42	12	.29

The paired-samples t-statistics in Table 2 showed that the vocabulary score of the within-samples experimental group significantly improved between pre-test and post-test after the provision of the

multiple-choice glosses (p = .004), regardless of types of language (L1 or L2) even though the significant level of the L1 glossing (p = .000) was slightly higher than that of the L2 glossing (p = .001).

Table 2. Paired Samples T-Statistics

Paired Samples	Mean Difference	SD	t	p
Pretest — Posttest	-2.58	2.43	-3.68	.004
(L1) Pretest — Posttest	-1.67	1.15	-5.00	.000
(L2) Pretest — Posttest	-1.92	1.56	-4.24	.001

4.2. Effects of Glossing and Proficiency Levels

The following statistics in Tables 3 and 4 showed the descriptive and paired-samples t-statistics of the advanced group, who was identified above TOEIC score 880, between pre-test and post-test. The paired-samples t-statistics showed that the mean score of the pre-test was statistically significant compared with that of the post-test (p = .014), as shown in Table 4. However, the main difference was due to the effect of the L2 MCGs (p = .007) rather than that of the L1 (p = .021). It seems that the L2 glossing could be more beneficial for the advanced group.

Table 3. Descriptive Statistics of Advanced Level

Glossing	Paired Samples	Mean	N	SD
MCGs in total	Pretest	3.20	5	.58
	Posttest	6.60	5	.24
L1 MCGd	Pretest	2.00	5	.32
	Posttest	3.80	5	.20
L2 MCGs	Pretest	1.20	5	.37
	Posttest	3.80	5	.20

Table 4. Paired Samples T-Statistics of Advanced Level

Paired Samples	Mean Difference	SD	t	p
Pretest — Posttest	-3.40	1.82	-4.19	.014
(L1) Pretest — Posttest	-1.80	1.09	-3.67	.021
(L2) Pretest — Posttest	-2.60	1.14	-5.09	.007

On the other hand, the pre-test mean score of the low group learners, who were identified below TOEIC score 700, were compared in their vocabulary score of the post-test, as shown in Tables 5 and 6. The paired-samples t-statistics in Table 6 showed that the difference between the participants' pre-test and post-test scores was not statistically significant (p > .05). However, the pre-test score of the target vocabulary in the L1 multiple-choice glossing was significantly different from its corresponding post-test score (p = .003) while the difference was not in the L2 (p = .116). Therefore, the low level learners more benefited from L1 MCGs in L2 vocabulary learning. In summary, the findings indicate that L2 proficiency level could influence the effects of types of language in the multiple-choice glosses on L2 vocabulary learning.

Table 5. Descriptive Statistics of Low Level

Glossing	Paired Samples	*Mean*	*N*	*SD*
MCGs	Pretest	3.50	4	.98
	Posttest	6.75	4	.25
L1 MCGs	Pretest	1.75	4	.25
	Posttest	4.00	4	.00
L2 MCGs	Pretest	1.75	4	.85
	Posttest	3.75	4	.25

Table 6. Paired Samples T-Statistics of Low Level

Paired Samples	Mean Difference	*SD*	*t*	*p*
Pretest — Posttest	-3.25	2.06	-3.15	.051
(L1) Pretest — Posttest	-2.25	.50	-9.00	.003
(L2) Pretest — Posttest	-2.00	1.82	-2.19	.116

4.3. Effects of Frequency on Vocabulary Learning

The following descriptive statistics in Table 7 showed how much the participants improved from the pre-test and post-test in terms of frequency of vocabulary in the text (e.g., 6 in parentheses means the frequency of the word).

Table 7. Descriptive Statistics of Frequency

Frequency	Paired Samples	*Mean*	*N*	*SD*
accommodation (6)	Pretest	.00	12	.00
	Posttest	.92	12	.08
presupposition (6)	Pretest	.25	12	.13
	Posttest	.92	12	.08
non-controversial (4)	Pretest	1.00	12	.00
	Posttest	1.00	12	.00
sensible (3)	Pretest	.33	12	.14
	Posttest	.75	12	.13
assert (3)	Pretest	.75	12	.13
	Posttest	1.00	12	.00
trigger (2)	Pretest	.75	12	.13
	Posttest	1.00	12	.00
recovery (1)	Pretest	.25	12	.13
	Posttest	.75	12	.13
spell (1)	Pretest	.17	12	.11
	Posttest	.75	12	.13

The paired-samples t-statistics in Tables 8－9[1] showed that there was statistically significant difference in the frequency of 6 (e.g., accommodation in L1 glossing and presupposition in L2 glossing) except the target word spell in L2 glossing. This indicates that at least 6 times of frequency is required to develop the academic vocabulary regardless of types of gloss languages.

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[1] There were no significant differences between advanced and low levels in terms of frequency of vocabulary.

TABLE 8. Paired Samples T-Statistics of Frequency with L1 Glossing

Paired Samples (Frequency)	Mean Difference	SD	t	p
accommodation—Posttest (6)	-.92	.29	-11.0	.000
non-controversial—Posttest (4)[2]	*	*	*	*
assert—Posttest (3)	-.25	.45	-1.91	.054
recovery—Posttest (1)	-.50	.90	-1.91	.082

Table 9. Paired Samples T-Statistics of Frequency with L2 Glossing

Paired Samples (Frequency)	Mean Difference	SD	t	p
presupposition—Posttest (6)	-.67	.65	-3.55	.000
sensible—Posttest (3)	-.42	.67	-2.16	.054
trigger—Posttest (2)	-.25	.45	-1.92	.082
spell—Posttest (1)[3]	-.58	.51	-3.92	.002

5. Conclusion

The current study showed that there were significant learning gains between pre-test and post-test after the provision of the multiple-choice glossing (MCG) regardless of types of glossing language (L1 or L2). This finding indirectly supported the previous research (Jozwik and Douglas 2017, Rott 2005, Yanagisawa et al. 2020), where multiple-choice glosses may lead to more vocabulary acquisition and text comprehension than single-translation glosses (Rott 2005). Ko (2012) found that there was no significant difference between texts with LI and L2 single-translation glosses on the immediate and delayed vocabulary tests in Korean contexts. However, Ko's (2017) study implicitly indicates that the glossing effect could be significant when students are offered both L1 and L2 single-translation glosses rather than either L1 or L2 even though she mainly focused on the proficiency effects on L2 vocabulary learning. Therefore, students can develop academic vocabulary better with the provision of MCG or the combination of both L1 and L2 single-translation glosses.

The current study also indicates that L2 proficiency level could affect the effects of types of language in MCG on academic vocabulary learning. The advanced level learners significantly improved from the pre-test to the post-test, but the difference was mainly due to the effect of L2 MCG rather than that of L1 MCG. It indicates that the L2 glossing could be more beneficial for the advanced group. However, the difference between the pre-test and the post-test score of the low levels was statistically significant after L1 MCG while the difference was not after L2 MCG. Therefore, the low level learners benefited from L1 MCG only in academic vocabulary learning while the advanced levels did from both L1 and L2 MCG.

Even though Yanagisawa et al. (2020) did not find any interaction between language (L1, L2) and proficiency (beginner, intermediate, and advanced) in their meta-analysis, the current study showed the influence of L2 proficiency. It could be due to the data analyses used in Yanagisawa et al. (2020). They used the research about general L2 vocabulary learning, not academic vocabulary which might require more in-depth processing and high proficiency levels. Ko (2017) found the effects of the proficiency in Korean contexts, where either L1 gloss or the L1+L2 gloss were beneficial for beginners' vocabulary learning while either L2 gloss or the L1+L2 gloss,

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[2] Because the mean score was 1 in the pre-test, no statistic analysis was available.
[3] The exception for this word might be due to the meaning transparency of the target word.

for advanced levels. This previous finding indicate that academic vocabulary learning can require more in-depth processing such as L1+L2 gloss than general vocabulary learning, which might influence the effect of proficiency levels.

On the other hand, the current study showed that there was statistically significant difference between the pre-test and the post-test scores with the words appearing more than 6 times in the text regardless of types of glossing languages. Hulstijn et al. (1996) indicate that frequency (three times) could contribute to learning when reading was supported by gloss or dictionary. They explained that the target words may be ignored or inferred incorrectly without such support of frequency. Choi (2016) also showed the positive effects of the frequency (twice vs. four times) of the target words on vocabulary learning, where the L1 group outperformed the L2 group in the long-term memory of F4 words only. The previous studies reported the positive effect of frequency (three or four times) on vocabulary learning, while the current study showed that it needed at least six times of frequency. Therefore, this indicates that academic vocabulary learning could require more frequency than general vocabulary learning (Joe 2010).

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Examples in: English
Applicable Languages: English
Applicable Levels: Tertiary

Appendix

Reading Text

This chapter is about information that is accommodated by the addressee as part of the non-controversial background necessary for utterance to be a sensible or an appropriate thing to say. Sometimes these accommodations seem to be triggered by a particular grammatical structure or lexical item, sometimes their recovery appears to be required for pragmatic reasons. Traditionally, the accommodated beliefs necessary for an utterance to make sense are known as semantic presuppositions and the accommodations needed for an utterance to be appropriate are known as pragmatic presuppositions.

Take the Saturday morning exchange between me and my wife:

(1) BRANKA: When will you be back?

PETER: I should be back by eight but you know what trains are like.

When Branka says 'When will you be back?', she doesn't regard my coming back as controversial. We both take this for granted. What she wants to know is when this presupposed event will occur. When I say 'you know what trains are like', I expect her to accommodate a non-controversial view of trains which I know she already holds and don't therefore need to spell out. In addition, there's clearly something in the wh-structure 'what trains are like' that triggers the presuppositions that <trains are like something>, the belief which I want my wife to accommodate. Notice this is not what I assert, it's what I presuppose – I assert that she 'knows' what trains are like. Indeed, I could have said

(2) You don't know what trains are like

In this case, I'd be asserting that the addressee doesn't know what trains are like. But with respect to the presuppositions, nothing changes. Both 'you know what trains are like' and 'you don't know what trains are like' are only sensible things to say if the addressee is willing to accept as non-controversial the background belief apparently triggered by 'what trains are like' that <trains are like something>.