THE ROLE OF GLOSSING AND THE BLANK-FILLING EXERCISE IN VOCABULARY LEARNING THROUGH READING: AN EMPIRICAL STUDY

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Abstract

The paper studies the effects of input enhancement and output tasks on vocabulary learning through reading by comparing learning through reading for meaning with learning under instructional intervention by means of glossing, blank-filling exercise with target words, and the combination of the two in an experiment. It is found that glossing alone does not have a significant effect on vocabulary learning, but the blank-filling exercise and the combination of glossing and the blank-filling exercise can significantly improve learning. Besides, glossing can decrease the influence of vocabulary size on vocabulary learning by helping with understanding word meaning.

Key words
glossing; blank-filling exercise; vocabulary learning

1. Introduction

Both the importance and difficulty of vocabulary learning in second language learning have always been recognized by learners. Nagy and her associates claim that most words are learned incidentally from extensive reading in first language acquisition (Nagy 1997). Some scholars studying second language acquisition (SLA) believe that the same way of vocabulary learning can be introduced to second language (L2) learners, while others doubt its efficiency and attempt at measures to facilitate vocabulary learning through reading.

Inspired by the information-processing model for investigating SLA, the researcher believes that instructional intervention in the form of input enhancement and output tasks in reading activities may facilitate the learning of vocabulary. Glossing the target words is a way to enhance input and the blank-filling exercise with target words is an output task. The research compares the effect of these two methods and their combination on the learning of English vocabulary through reading by adult learners in China with an experiment. Implications for teaching practice are proposed according to the findings.

2. Theoretical framework and related studies

The general framework based on the information processing model for investigating SLA usually identifies input, intake, the interlanguage system, and output (Gass 1988; VanPatten & Cadierno 1993; Ellis 1994). Input refers to the language data available in the environment, but only the portion that enters the learner's working memory (WM) and may later be integrated into long-term memory (LTM) is referred to as intake. According to Schmidt's Noticing Hypothesis, "intake is that part of the input that the learner notices" (Schmidt 1990: 139). Noticing is the necessary condition for input to get further processed, but additional processes are needed for it to be useful for interlanguage development. According to Gass (1988), noticed input needs to be processed for meaning to become comprehended

input. She draws a distinction between comprehension for the purpose of current communication and comprehension for learning and argues that only the second type of comprehended input becomes intake because it involves analysis of form other than meaning. For Robinson (1995), noticing involves not only detection, cognitive registration of sensory stimuli (Tomlin & Villa 1994), but also rehearsal, the nature of which depends on task demands. Among the two types of rehearsal, elaborative rehearsal, which involves relating new information to existing knowledge, is supposed to be more beneficial for retention than maintenance rehearsal according to the Depth of Processing Hypothesis in cognitive psychology. This is because it increases associations with the item at encoding and thus creates more potential cues for its retrieval (Ellis & Hunt 1989). The integration of intake into LTM brings about changes in the interlanguage system, which is the basis for language output. According to the Output Hypothesis, in producing the target language, learners may notice a gap between what they want to say and what they can say so that they may try to seek a solution in future input and process the relevant features with more focused attention (Swain 1995).

The reason for the low efficiency of incidental learning of L2 vocabulary may lie in the inadequate conditions for noticing and comprehension in the process of SLA. This is especially true for learners of a language as a foreign language, such as the students learning English in China. The amount of input is not so large as that for children learning a first language, thus the lower frequency of encounters with new words and smaller chance for them to get noticed. When new words are encountered in limited contexts, comprehension cannot be guaranteed because there may be unfavorable contextual factors for inferencing (Laufer 1997). Besides, the comparatively low language proficiency, especially vocabulary size, of the learners themselves makes inferencing more difficult (Nagy 1997; Coady 1997; Nation 2001). In the foreign language setting, limited use of L2 words in daily life also fails to force repeated and elaborate processing of the words learned from extensive reading as for first language school children (Hulstijn 2001).

Therefore, measures need to be taken to complement incidental vocabulary learning. The degree to which input is noticed is to some extent affected by its perceptual salience. Using underlining, italics or bold letters, and glossing can increase the salience of target words and thereby their chance of getting noticed (Nation 2001). Glossing can also help learners with comprehension when inferencing fails. The positive effect of glossing on vocabulary learning through reading has been confirmed by Jacobs, Dufon and Fong (1994), Hulstijn, Hollander, and Greidanus (1996), Watanabe (1997), Rott, Williams and Cameron (2002) and Duan and Yan (2004). Rott and Williams (2003) qualitative study further shed light on the processing learners engage in when reading texts with glosses that facilitate the learning of the glossed words. There have also been researches into the effect of where the gloss appears on vocabulary learning. Watanabe (1997) found that gloss directly following a new word in the text had a negative effect on vocabulary learning. Holley and King (1971, as cited in Nation, ibid.) did not find any difference whether the gloss appeared in the margin, at the bottom of the page, or after the text, while Jacobs et al. (1994) found that learners preferred gloss in the margin. On the other hand, glossing may discourage the processing involved in searching for word meaning, which constitutes one of the three basic components of involvement, a construct in the Involvement Load Hypothesis (Laufer & Hulstijn 2001) for the evaluation of task effectiveness for vocabulary learning. Hulstijn found that words whose meanings were given were not remembered so well as words whose meanings were correctly inferred (1992) or looked up in a dictionary (Hulstijn et al., 1996).

Requirement to use a target word in output may not only focus learners attention on it in the input, but also force deeper processing of the word that may facilitate its retention. According to Laufer and Hulstijn s (2001) Involvement Load Hypothesis, the greater involvement the task induces, the more effective it is for vocabulary learning. For example, a task that requires learners to choose from a list of words including the target words to complete sentences or texts involves comparing the target words with other words and induces a certain amount of involvement. It has a positive effect on vocabulary learning. But a sentence-writing or composition task that requires the use of the target words is more effective because it involves the creation of context according to a specific meaning of the word and induces a greater amount of involvement.

The hypothesis is supported by evidence from empirical studies by the authors themselves (Hulstijn & Laufer 2001) and Kim (2008), but only partially supported by the studies by Huang (2004) and Lei, Wei, Ye and Zhang (2007) in China. Huang (2004) found that both sentence-writing and blank-filling facilitated vocabulary learning through reading and the former was more effective than the latter for retention, but not significantly more effective in the immediate test. Lei et al. (2007) compared reading with target words glossed, writing with target words glossed and writing with target words looked up in the dictionary. The result showed that the output task in both conditions facilitated vocabulary learning, but whether the words were glossed or looked up by the learners themselves did not make significant difference. This was against the Involvement Load Hypothesis in the assumption that search for word meaning would induce greater amount of involvement and be more effective for vocabulary learning.

Among the studies on the different means of instructional intervention with vocabulary learning through reading, few have investigated their comparative or combined effects. Rott et al. (2002) examined vocabulary learning in four different conditions: reading, reading glossed text, reading plus a text reconstruction task, and reading glossed text plus a reconstruction task. Glossing was found to be facilitative for learning both with and without the output task, but the output task did not have a significant effect on learning. One problem was that the text reconstruction task did not require the use of target words. It was also found that learners who did use the target words in their output achieved relatively high scores in the target word test.

There has been no research of this type in China. The current study aims to investigate whether glossing (G), the blank-filling exercise (B), which is a frequently used output task, and the combined use of the two (GB) can facilitate vocabulary learning through reading. In addition, it attempts to find out how such instructional interventions affect learners of different levels of vocabulary proficiency.

3. The empirical study

3.1 Research questions

1) Compared with the ordinary reading activity (R), how do G, B, and GB added to the reading activity facilitate vocabulary learning?
2) How does learners vocabulary size affect vocabulary learning outcome in the R, G, B, and GB conditions respectively?

3.2 Research methods

3.2.1 Subjects and procedures

The subjects were the two classes of first-year English major students of a university in Shanghai. The total number was 45, 22 and 23 in the two classes respectively. They were given a vocabulary size test before the experiment and the result was submitted to independent-sample T test by SPSS. No significant difference was found between the two classes at any of the 2,000, 3,000 and 5,000 word levels or the total vocabulary size.

The experiment was carried out in two stages, each lasting for 4 weeks. The 22 students in one class served as the control group (R) during the first stage and experiment group 2 (B) during the second stage and the 23 students in the other class served as experiment group 1 (G) and experiment group 3 (GB) respectively during the two stages. Table 1 presents the arrangement of the four learning conditions for the subjects of the two classes during the two experiment stages.

Table 1. Arrangement of learning conditions

Stage	Class One (22 subjects)	Class Two (23 subjects)
I	R	G
II	B	GB

R and G were supposed to complete a meaning-focused task after reading each of the texts, i.e. to write a summary, outline or review about the text, so that the subjects would focus their attention on understanding the message instead of learning the vocabulary in the text, as expected for the condition of incidental vocabulary learning. G differed from R in that the subjects were given glosses of the target

words as a means of input enhancement in addition to the reading text. At the end of the first stage, the subjects were given a test without warning on the content of the reading texts as well as the target words in order to prevent the subjects from focusing their attention on vocabulary learning during the second stage. The test lasted for one and a half hour, the target word test taking up 45 to 60 minutes.

In addition to the meaning-focused task, B and GB were required to complete an output task, i.e. completing sentences by filling the blanks with target words. Likewise, GB was given glosses of the target words in addition to the same reading texts for B, but B was given the first one or two letters for each of the target words in the blank-filling exercise in order to make the choice easier. Another surprise test on the target words which lasted for 45 to 60 minutes was given at the end of the second stage.

In order to make sure that the subjects spent similar amount of time on the learning tasks during the two stages, discussion about the content of the reading texts was arranged as part of the teaching activity in class during the first stage.

3.2.2 Materials

The reading texts were taken from College English Extensive Reading (Book 3 and Book 4), which had been used as the textbooks for the English Extensive Reading Course for first-year English major students at the university during the previous years. During each of the two 4-week stages, the subjects were given 1 text of about 1500 words to read and related tasks to complete every week as their homework for the course.

The vocabulary syllabus for College English Test (Band 4) as well as the glossary at the back of the textbooks was referred to in deciding which words were to be glossed. The glossary took the form of a word list after the reading text with the English word, its grammatical category and contextual meaning in Chinese for each entry. The G and GB subjects were asked to report which words in the glossary they had already known when they handed in their homework each time. For each of the two stages, 30 target words were decided upon for the final test among the words that none of the subjects had reported knowing before.

3.2.3 Instruments

The Vocabulary Levels Test (VLT) (Schmitt et al. 2000, as cited in Nation 2001) was used to measure the subjects vocabulary size. Considering that the subjects had just finished their study at senior middle school when they took the test, only the part of the test at the 2,000, 3,000, and 5,000 word levels was given. There were 30 items at each level. One correct matching of word form with meaning was credited with one point, so the full mark for each level was 30 and the whole test, 90.

Adaptation was made to the Vocabulary Knowledge Scale (VKS) (Paribakht & Wesche 1997) to measure the experiment results. For each of the two target word tests, the subject was credited with a score from 1 to 6 according to his/her level of knowledge about each of the 30 target words and the full score was 180. A score of 1 was given if the word was not familiar at all and 2, the word was familiar but its meaning was not known. A score of 3 was credited for partial or vague knowledge about the word indicated by an explanation of part of its meaning, or a correct synonym or translation together with the subject s acknowledgement of being uncertain about the answer. A score of 4 was given for a correct synonym or translation, 5, a correct synonym or translation plus use with semantic appropriateness in a sentence, and 6, a correct synonym or translation plus use with semantic appropriateness and grammatical accuracy in a sentence. The test results were submitted for analysis by SPSS.

3.3 Results and discussion

3.3.1 Vocabulary learning outcome in the four conditions

Table 2 shows the descriptive statistics of the target word test results of the four groups. In order to investigate whether the differences among the four groups reached statistical significance, independent-sample and paired-sample T tests were conducted and the results are shown in Tables 3 and 4.

Table 2. Descriptive statistics of the target word test

Group	Mean of total score	Mean of score per target word	Standard deviation
R	58.86	1.96	14.84
G	60.78	2.03	12.82
B	81.14	2.70	17.70
GB	95.30	3.18	14.28

Table 3. Independent-sample T tests between G and R and between GB and B

Groups in comparison	Levene's Test for Equality of Variances		T test for equality of means			
		F	Sig.	t	df	Sig. (2-tailed)
G / R	Equal variances assumed	1.220	.276	.465	43	.644
GB / B	Equal variances assumed	1.760	.192	2.961	43	.005

Table 4. Pair-sample T tests between B and R and between GB and G

Groups in comparison	t	df	Sig. (2-tailed)
B / R	6.360	21	.000
GB / G	10.734	22	.000

We can see that although G did better than R, there was no significant difference between these two groups, while GB did significantly better than B; GB and B did significantly better than G and R respectively. Thus, the vocabulary learning outcome in the four conditions can be ranked from the worst to the best as: R < (non-significant difference) G < (significant difference) B < (significant difference) GB.

The means of the score per target word for R and G are around 2, indicating that learners may only have an impression of the form of the target words, but cannot acquire their meaning through reading, with or without glossary. This proves that vocabulary gained from an ordinary reading activity focusing on understanding the meaning is very little. Learners are not likely to acquire the meaning of particular words because general comprehension can be achieved through top-down processing without comprehension of each single word. They may rely on other types of information, such as contextual information and their own knowledge about the real world, to compensate for their deficiency in linguistic knowledge to achieve reading comprehension (Izumi 2003). It is also because of this reason that learners may not pay attention to the glossary provided. Even if they do and get the meaning of the word, this type of comprehension may be only for the purpose of current communication, i.e. understanding the message in the text. It does not involve analysis of language form and will not become intake and integrated into the interlanguage system (Gass 1988). As can be seen from the experiment result, glossing did not have a significant effect on vocabulary learning. This contradicts the findings from previous studies probably because the glossaries that appeared after the reading texts in this experiment were not so effective in attracting learners' attention as the marginal glosses used in previous studies. Whether glossing closer to the words glossed and other forms of input enhancement can facilitate vocabulary learning still needs to be investigated.

The mean of the score per target word for B is a little lower than 3 and that for GB is a little higher than 3. This suggests that learners can acquire a vague or partial knowledge about the meaning of most of the target words through reading plus the blank-filling exercise. The finding is consistent with previous studies which show that the output task can improve vocabulary learning. To complete the task, learners must understand the meaning of the target words. This type of comprehension is not likely to be merely for the purpose of current communication in the meaning-oriented reading activity, but rather for the form-oriented learning activity. The blank-filling exercise thus manages to cause the learners to attend to the target words and try to work out their meaning. To complete the task, they also need to compare a word with other words to judge which fits the sentence context in the blank-filling exercise. This would involve activation of existing knowledge about the other words as well as linguistic and extra-linguistic knowledge to appreciate the context, to which the target words may be associated. According to the Involvement Hypothesis, the task induces greater involvement load in all of the three criteria, need, search, and evaluation, than the ordinary reading activity. In other words,

the blank-filling exercise not only promotes noticing and comprehension of the input, but also forces rehearsal of the input of a more facilitative nature for retention.

Nevertheless, even after they complete the blank-filling exercise, learners are still unlikely to use the target words properly in production. This output task only requires learners to understand the meaning of the target words to make the sentences into which they fit semantically appropriate. It does not require creative use with grammatical accuracy. Therefore, learners may develop knowledge about word meaning, but not other aspects of word knowledge for productive use. If output is supposed to turn top-down semantic analysis into bottom-up syntactic analysis to develop grammatical accuracy, as Swain (1995) argues, production of complete sentences might be necessary. Output tasks like sentence-writing or composition with target words are more effective for vocabulary learning probably not only because they require the creation of original contexts and induce greater amount of involvement (Laufer & Hulstijn 2001), but also because they make a greater demand on syntactic analysis and may promote the development of other aspects of word knowledge than meaning for productive use. Processing a word for more aspects of knowledge about it will also improve retention of the word. So even though no significant difference may exist between the blank-filling exercise and sentence-writing or composition immediately after the treatment, such difference may appear at a delayed test (Huang 2004).

Learning in the GB condition is significantly better than that in all of the other three conditions. As glossing added to the ordinary reading activity did not improve learning, why did glossing added to reading plus the output task make a change? As suggested above, the reason for the failure of glossing to exert an effect on learning lies in its failure to get noticed in the first place. Noticing is the first step for any information to get processed. When learners attention is directed to the new words and to the glossary because of the output task, the function of the glossary in helping learners with comprehension of the target words comes into play. As suggested by Rott et al. (2002), the output task itself does not serve to establish form-meaning mapping. Learners may try to infer the meaning of the target words from context or word form to complete the blank-filling exercise, so their knowledge about word meaning may remain vague and imprecise. With the help of the glossary, however, learners are likely to acquire a more precise knowledge about the meaning of the target words.

3.3.2 The relationship between vocabulary size and vocabulary learning outcome in the four conditions

According to the result of the correlational analysis, the target word test scores of the subjects in G and GB did not correlate with their scores at any of the 3 word levels or the total score of the vocabulary size test. Neither did the scores for the two target word tests during the two experimental stages of the same group correlate with each other. In the R and the B treatment conditions, however, vocabulary learning outcome correlated with vocabulary size at the 5,000 word level and the total vocabulary size (see Table 5). The scores for the two target word tests during the two experimental stages of this group also correlated with each other (Pearson Correlation =.502, Sig. =.017).

Table 5. Correlations between learners vocabulary size and target word test results

Group		5,000 word level	Total
R	Pearson Correlation	.702 (**)	.673 (**)
	Sig. (2-tailed)	.000	.001
B	Pearson Correlation	.480 (*)	.540 (**)
	Sig. (2-tailed)	.024	.009

** Correlation significant at the 0.01 level (2-tailed), * Correlation significant at the 0.05 level (2-tailed).

In incidental vocabulary learning through reading, whether the meaning of a word can be inferred successfully from context is an important factor in whether it can be acquired (Nagy 1997). The larger vocabulary size the learner has, the more likely reading comprehension and successful inferencing can be achieved (Nation 2001). Ellis (1997: 135) explains that inferencing is a top-down process which "involves conscious application of strategies for searching for information, hypothesis formation and testing" If most of the words in the text can be recognized (lower-level processing) automatically, cognitive resources can be freed for the higher-level processing of inferencing.

In the R and the B conditions, learners with a larger vocabulary size were more likely to infer the correct meaning of the target words, so they were also more likely to achieve a better learning outcome. The correlation between vocabulary size and vocabulary learning outcome also became stronger at higher word levels. This is because words at lower levels are acquired earlier and used more frequently, so learners have developed similar degrees of mastery, but when it comes to words at higher levels, difference among individual learners is greater and the influence of vocabulary knowledge on learning is more prominent.

With access to the glossary, however, learners with a smaller vocabulary size, though they may fail at inferencing, could still get the meaning of the target words. Therefore, in learning conditions where glossing was provided, vocabulary learning outcome did not correlate with vocabulary size. To some extent, the instructional intervention can make up for what the less proficient learners lack. This is also true of the blank-filling exercise. Although vocabulary learning outcome still correlated with vocabulary size in the B condition, the correlations were weaker, especially at the 5,000 word-level. When learners directed their attention to the target words in order to complete the blank-filling exercise, they may try to get their meaning through other strategies, such as dictionary consulting. In this way, the influence of vocabulary size or the ability to infer word meaning from context on vocabulary learning outcome became less prominent.

4. Conclusion

The research compares vocabulary learning in meaning-focused reading activities with that in reading activities with instructional interventions of glossing, the blank-filling exercise and the combination of the two to investigate the effect of input enhancement and output tasks on vocabulary learning through reading.

Incidental vocabulary learning through meaning-focused reading is not efficient. Output tasks can make learning significantly more efficient by prompting learners to process the new words with more focused attention and cognitive effort. The function of glossing lies in the chance for better comprehension it provides, as compared to inferencing, so that input is more likely to turn into intake. But the precondition for that is it gets noticed, as prompted by the output task. Otherwise, it may fail to call learners attention to the new words or help with comprehension in the sense of turning input into intake. Therefore, the combination of glossing and output tasks is most effective in facilitating vocabulary learning through reading. It has to be noted, however, if more comprehensive knowledge about the new words is to be achieved, more demanding tasks as well as repeated use for consolidation are necessary.

The outcome of vocabulary learning through reading activities without instructional intervention correlates strongly with the learner s vocabulary size. The correlation is less strong in learning conditions with output tasks and almost absent in learning conditions where glossing is provided. Glossing can directly compensate for the poorer ability to infer word meaning from context of learners with a smaller vocabulary size, while the similar function of output tasks has to be realized by encouraging learners to seek word meaning through other strategies and is therefore less direct and less prominent.

The role of the blank-filling exercise was investigated through a repeated experiment with the same sample in the study. Although cautions had been taken in research design, the possibility cannot be completely excluded that the better learning outcome at the second stage of the experiment was a result of the influence of the first stage in addition to the effect of the task itself. The target words used in the two stages were different and different characteristics of the target words might also affect the learning outcome, though a reasonably large number of target words were used to diminish the impact in the research. Another experiment with independent samples and same target words would be ideal.

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