

**The Effects of L1 and L2 Glosses  
on Reading Comprehension  
and Recalling Ideas by Saudi Students**

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## **The Effects of L1 and L2 Glosses on Reading Comprehension and Recalling Ideas by Saudi Students**

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### **Abstract:**

This study investigates the effect of different types of gloss conditions on reading comprehension and ideas recall. Ninety second-year male English department undergraduate Saudi students were randomly selected and randomly divided into three conditions; L1 (Arabic) gloss, L2 (English) gloss, and no gloss. They read a 470-word English text with 19 glossed words. Results of reading comprehension test showed that there was an advantage of L1 glosses over L2 glosses. The difference was significant. But the differences between no gloss and L1 gloss and L2 gloss conditions were not significant. Results of recall protocol showed that participants with L1 glosses and those with no gloss recalled significantly more ideas than participants with L2 glosses did. When surveyed, more than (94%) of participants preferred to have glosses and (50%) favored L2 glosses for their reading material.

## تأثير أنواع مختلفة من تفسير المفردات على استيعاب النص وتذكر الأفكار الرئيسة في النص عند الطلاب السعوديين

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الملخص :

بحثت هذه الدراسة في تأثير أنواع مختلفة من تفسير المفردات على استيعاب النص وتذكر الأفكار الرئيسة في النص عند الطلاب السعوديين . تسعون طالباً يدرسون في السنة الثانية بقسم اللغة الانجليزية بجامعة أم القرى تم اختيارهم وتوزيعهم إلى ثلاث مجموعات عشوائياً. المجموعة الأولى قرأت نصاً من ٤٧٠ كلمة وأعطيت لهم معاني المفردات بالعربية لـ ١٩ مفردة . المجموعة الثانية قرأت نفس النص بوجود معاني المفردات باللغة الانجليزية . أما المجموعة الثالثة فقرأت النص بدون أي معاني للمفردات . تم اختبار المجموعات الثلاث لقياس فهم النص والأفكار التي تم تذكرها . أثبتت الدراسة أن المجموعة التي زودت بمعاني المفردات باللغة العربية كانت أفضل من تلك التي زودت بمعاني المفردات باللغة الانجليزية وكان الفرق ذا دلالة إحصائية . كما أظهرت الدراسة أن من زودوا بمعاني المفردات باللغة الانجليزية تذكروا أفكاراً أقل من المجموعتين الأخريين، وكان الفرق ذا دلالة إحصائية .

كما أظهرت الدراسة تفضيل الطلاب الواضح لوجود معاني المفردات . فمن نسبة ٩٤٪ من الطلاب الذين فضلوا وجود معاني المفردات مع النص ، فضل ٥٠٪ منهم وجود معاني المفردات باللغة الانجليزية .

### **Introduction:**

The use of vocabulary glosses is common in second language materials (Davis, 1989). Bell and LeBlanc (2000) state that glossing is the most common form of text adaptation since it assists the reader in comprehending words and phrases and, therefore, helps second language learners to comprehend reading materials. Gloss is defined as an explanation of the meaning of a word (Pak, 1986) or a brief definition or synonym either in L1 or in L2 (Nation, 2001).

Much research has been done examining the effect of glossing on reading comprehension and vocabulary learning. The attempts have brought mixed results, some suggesting that glossing enhance reading comprehension and vocabulary learning (Davis, 1989; Jacobs, 1994; Hulstijn, Hollander, and Greidanus, 1996), and others indicate that glossing has little or no effect on reading comprehension (Johnson, 1982; Jacobs, DuFon, & Fong, 1994; Ko, 1995).

Quite recently, the focus has shifted from whether glossing has positive effect on reading comprehension and vocabulary learning to which type of glossing; L1 or L2 is more effective. Results of many studies have brought mixed and conflicting results since the issue of native language (L1) glossing in L2 reading comprehension is an issue of debate (Taylor, 2002). Several studies have found that the difference between L1 and L2 glosses is not significant.

Jacobs, DuFon, and Fong (1994) investigated the effects of L1, L2 and no gloss on foreign language reading comprehension and foreign language vocabulary learning. Eighty-five English speaking participants who were learning Spanish had to read a Spanish text with 613 words under three conditions: (1) L1 gloss (English); (2) L2 gloss (Spanish); and (3) No gloss. After reading the text which had 32 glossed words, participants had two

unexpected test; one immediately after the reading and the other four weeks later. Results showed that L1 and L2 gloss conditions were better than the no gloss condition and that the difference between L1 and L2 condition was not statistically significant. However, participants expressed preference for L2 glosses to L1 glosses.

Bell and LeBlanc (2000) studied learners' actual behavior to determine which gloss; L1 or L2 is used more frequently for computer-based reading. Forty third-semester Spanish learners were divided into two groups; one read the Spanish text with English glosses, and the other read the same text with Spanish glosses. The text was a 409-word short story with 67 glossed words. Participants read the text on the computer screen and the glossed words appeared underlined and highlighted in blue. By clicking on the underlined word, another screen is opened which contained the target word and the gloss information. There was a tracking system to record each hit on the page. Subjects took a comprehension test immediately after reading the text. Results showed that participants demonstrated a preference for using glosses in L1 since "the English gloss group clicked on about twice as many of the words as did the Spanish group"(p.279). The result of the comprehension test showed that the difference between English gloss group and Spanish gloss group was not statistically significant. Thus, the language of glosses was not a significant variable. Participants preferred L1 glosses over L2 glosses.

In another study, Chen (2002) investigated the same issue with Taiwanese participants studying English as a second language. Eighty-five college freshmen were divided into three groups: L1 gloss (Chinese), L2 gloss (English), and No gloss. They read a 193-word English text with 20 glossed words. Results of this study showed that the difference between L1 and L2 gloss groups was not statistically significant and that the L2 gloss group outperformed the no gloss group.

Yoshii (2006) examined the effectiveness of L1 and L2 glosses on incidental vocabulary learning. He aimed to investigate whether the use of picture glosses (text-plus-picture) affects vocabulary learning. One hundred ninety five college Japanese students learning English as a foreign language participated in the study and were divided into four groups: (1) text-only glosses (L1); (2) text-only glosses (L2); (3) text-plus-pictorial glosses (L1); and (4) text-plus-pictorial glosses (L2). Participants read a 390-word story on the computer with 14 glossed highlighted words. As participants clicked on a word, a gloss appeared on the right-hand side of the screen. With text-plus-picture glosses, both the gloss and the picture appeared on the screen. Participants received two post-tests; one immediately after reading the text and the other two weeks later. Each test consisted of two types: a definition-supply and a recognition test. Results showed that there was no significant difference between L1 and L2 glosses at any of the two tests. The researcher found that "the L1 text-only group displayed a rather unique pattern of retention over time: this group was able to sustain its scores, while the other three groups showed declines in their scores" (p. 93).

While the studies above showed that the difference between L1 and L2 glosses is not significant, some studies have provided evidence that L2 glosses have greater effect than L1 glosses do. Miyasako (2002) investigated the effectiveness of L1 and L2 single and multiple-choice glosses. One hundred and eighty seven Japanese students were divided into six groups: (1) L2 (English) multiple-choice gloss; (2) L1 (Japanese) multiple-choice gloss; (3) L2 (English) single gloss; (4) L1 (Japanese) single gloss; (5) No gloss; and (6) Control group (no reading). Participants read a 504-word text with 20 glossed words. They had two tests; one immediately after reading the text and the other 18 days later. The test was a multiple-choice test in which each target word was followed by four choices and the subject had to choose the most appropriate definition. Results showed that L2 gloss groups outperformed L1 gloss groups with multiple-choice and single glosses in the immediate

test. There was no difference between the two types of glosses; multiple-choice and single, in vocabulary learning.

Ko (2005) investigated how different types of gloss conditions affect reading comprehension. Ninety-four Korean undergraduate students were divided into three groups: (1) no gloss; (2) L1 gloss; and (3) L2 gloss. They read a 277-word text with 25 glossed words for 15 minutes, took a multiple-choice comprehension test, and completed a questionnaire about the best gloss types participants prefer and their reasons. Results showed that there was a significant difference between no gloss ( $m = 19.58$ ) and L2 gloss condition ( $m = 21.61$ ). L2 gloss group had a larger mean than L1 gloss condition. The survey finding showed that (62%) of participants preferred L2 glosses, (32%) preferred the L1 glosses, and only (6%) preferred no gloss.

To sum up, the studies mentioned above have revealed conflicting results about the effect of L1 and L2 glosses on reading comprehension and what type of glosses learners prefer. Thus, the current study aims to address these issues. The research questions are:

- 1- Do L1, L2, and no gloss differ in their effectiveness on L2 reading comprehension?
- 2- Do different types of glossing affect L2 reading recall?
- 3- Do L2 learners have different preferences for gloss types?

## **Methods:**

### *Participants:*

A total of 90 male students enrolled at the Department of English, Umm Al-Qura University, Makkah, Saudi Arabia participated in the study. They were second-year learners of English as a foreign language. All had studied English for seven years; six before entering the university and one year at the department. All were non-native speakers of English. They were randomly selected and randomly assigned to one of the three groups; L1 gloss group, L2 gloss group, and no gloss group.

***Materials:***

The participants read a 470-word text. It was selected by three professors of English from "America - Today and Tomorrow" website (<http://www.geocities.com/yamataro670/readinglab.htm>).

A pretest was administered a week prior to the treatment to gauge participants' knowledge of the glossed words in the text. The test contained 30 words from the 470-word text and participants were instructed to provide the meaning of the words they knew. Eleven words were excluded since most participants knew their meaning and the remaining 19 words were glossed. The reading text was adapted into three forms: a text with no glosses, a text with L1 (Arabic) glosses, and a text with L2 (English) glosses placed on the same line as the glossed words. In order to obtain the most appropriate definitions of the English words, two professors of translation checked the definitions against the original text. Glossed words were underlined and boldfaced in the text.

Coding the ideas in the text was done by George Jacobs. T-unit, the criterion used for idea units, is defined by Richards, Platt, and Weber (1985) (cited in Jacobs, 1994, pp. 299-300) as:

".....a measure of the linguistic complexity of sentence, defined as the shortest unit which a sentence can be reduced to, and consisting of one independent clause together with whatever dependent clause are attached to it." (pp. 299-300, cited in Jacobs, 1994).

Jacobs identified thirty-eight t-units in the text. The researcher performed the coding for the correctly recalled ideas by participants.

***Procedures:***

Participants were randomly assigned to one of three groups: no gloss, L1 gloss, and L2 gloss. They were instructed to read the text. After that, the reading material was collected and a multiple-choice reading comprehension test was administered. The test consisted of ten items in English and covered all parts of the text. Participants were instructed to choose the correct answer from among four choices. Once they finished the comprehension test, they were given a one -item questionnaire in

which they had to tell which type of glosses they prefer. After that, participants were requested to write the recall of what they had read in L1.

**Results:**

Means and standard deviations of the correct answers and the recalled t-units are presented below. An Analysis of Variance (ANOVA) was used to analyze the data collected with a significant level set at .05. Once ANOVA showed significant difference, Post Hoc Test Tests were used to show the relationships between the gloss types one at a time.

Table (1)  
Means and Standard Deviation of Reading Comprehension Test

Condition	N	Mean	Std. Deviation
No gloss	30	7.90	1.73
L1 (Arabic) gloss	30	8.20	1.85
L2 (English) gloss	30	6.90	1.83

As Table 1 clearly shows, participants who read the text with L1 (Arabic) glosses answered more questions than other participants did. In turn, participants who read the text with L2 (English) glosses answered fewer questions than other participants did. The low standard deviation for all conditions is caused in part by ceiling of 10 possible correct answers.

Table (2)  
Analysis of Variance of Number of Correct Answers / Score (out of 10)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	27.800	2	13.900	4.285	.017
Within Groups	282.200	87	3.244		
Total	310.000	89			

Table 2 reports an F of 4.285, which with 2 and 87 degrees of freedom is statistically significant at the .001 level ( $P < 0.05$ ). These figures indicate that the differences across independent variable categories are significant at a very low probability. Therefore, we can feel comfortable in rejecting the "Null Hypothesis" of no difference between the three types of glossing.

Table (3)  
Post Hoc Tests

Dependent Variable: correct answers (out of 10)

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
No Glossing	Arabic Glossing	-.300	.462	.793	-1.41	.81
	English Glossing	1.000	.459	.084	-.10	2.10
Arabic Glossing	English Glossing	1.300(*)	.474	.022	.16	2.44
	No Glossing	.300	.462	.793	-.81	1.41
English Glossing	Arabic Glossing	-1.300(*)	.474	.022	-2.44	-.16
	No Glossing	-1.000	.459	.084	-2.10	.10

\* The mean difference is significant at the .05 level.

The difference between the mean of the correct answers of the L1 (Arabic) gloss condition (8.20) and the mean of the correct answers of the L2 (English) gloss condition (6.90) is statistically significant, as Table 3 clearly shows. On the other hand, the differences between the means of the other conditions are not statistically significant.

Table (4)  
Means and Standard Deviation of Recalled Ideas

Condition	N	Mean	Std. Deviation
No gloss	30	5.10	3.46
L1 (Arabic) gloss	30	5.60	3.46
L2 (English) gloss	30	2.50	2.26

These results are similar to those in Table 1. Participants who read the text with L1 (Arabic) glosses recalled more ideas than other participants did. The mean number of recalled ideas from the No gloss condition ranks second, followed by L2 (English) gloss condition.

Table 5  
Analysis of Variance of Number of Recalled Ideas  
T-units (out of 38)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	166.200	2	83.100	8.592	.000
Within Groups	841.400	87	9.671		
Total	1007.600	89			

Table 5 reports an F of 8.592, which with 2 and 87 degrees of freedom is statistically significant ( $P < 0.05$ ). By this point, it is not surprising that differences across independent variable categories are significant at a very low probability. Therefore, we can feel comfortable in rejecting the "Null Hypothesis" of no difference between the three glossing groups regarding recalled ideas. The significant relationship described in Table 5 above is further explored in Table 6 via a series of Post Hoc Tests.

Table (6)  
Post Hoc Tests  
Dependent Variable: recalled ideas (out of 38)

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
No Glossing	Arabic Glossing	-.500	.893	.842	-1.65	1.65
	English Glossing	2.600(*)	.754	.003	.78	4.42
Arabic Glossing	English Glossing	3.100(*)	.754	.000	1.28	4.92
	No Glossing	.500	.893	.842	-1.65	2.65

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(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
English Glossing	Arabic Glossing	-3.100(*)	.754	.000	-4.92	-1.28
	No Glossing	-2.600(*)	.754	.003	-4.42	-.78

\* The mean difference is significant at the .05 level.

The difference between the mean of accurately recalled ideas by No Gloss participants (5.10) and the mean of recalled ideas by L2 (English) gloss participants (2.50) is statistically significant ( $P = 0.003$ ) as Table 6 clearly shows. Also the difference between the mean of recalled ideas by L1 (Arabic) gloss participants (5.60) and the mean of recalled ideas by L2 (English) gloss participants (2.50) is statistically significant since  $P = 0.000$ . On the other hand, the difference between the means for correctly recalled ideas by No Gloss and L1 (Arabic) gloss participants is not statistically significant since the means are close.

Table (7)  
Gloss Preferences

Gloss type	No.	Percentage
L1 (Arabic) Gloss	40	44.44 %
L2 (English) Gloss	45	50 %
No Gloss	5	5.56%

Table 7 shows that (94%) preferred to have glosses. (50%) preferred to have English glosses, and about (44%) wanted Arabic glosses.

### **Discussion:**

The first research question asked whether no gloss or the use of L1 and L2 glosses differ in their effectiveness on L2 reading comprehension. Results of the reading comprehension test in the present study clearly indicate a significant effect for the use of L1 glosses on reading comprehension. This finding is consistent with the results of previous studies such as Aweiss (1994), Luo (1993), and Stoehr (2000). The use of L2 glosses did not seem to affect reading comprehension positively as L1 glosses did. Thus, the present study confirmed the usefulness of L1 glosses in L2 reading comprehension. Moreover, the difference between L1 gloss condition and no gloss condition is not significant. This finding is consistent with results of previous studies such as Goyette (1995), Ko (1995), Miyasako (2002), and Ko (2005).

Therefore, this study confirms the usefulness of using L1 glosses in L2 reading comprehension. Possible explanation for the effectiveness of L1 glosses is that L2 learners process the text with L1 glosses faster than that without L1 glosses and this is explained through the model of lexical and conceptual representation revised by Kroll & Stewart (1994). This model proposes that the conceptual links are stronger between L1 and concepts than between L2 and concepts, and "the lexical link from L2 to L1 is assumed to be stronger than the lexical link from L1 to L2 because L2 words were initially associated to L1" (Kroll & Stewart (1994) p. 158). They claim that forward translation takes longer to perform because it requires concept mediation and influence by the presence of semantic context. Backward translation, on the other hand, takes a short time because it requires a lexical mediation and is not influenced by the semantic context. The same idea is claimed by Harites and Nelson (2001) who say "L1 initially serves as a lexical intermediary between L2 and conceptual meaning. As a result, lexical links from L2 to L1 are stronger than lexical links from L1 to L2, and conceptual links to L1 are initially stronger than conceptual links to L2." (p. 419).

A direct link between L2 words and concepts is possible with more proficient learners (kroll & sunderman, 2003, cited in Yoshii, 2006). Based on this model, the results are predictable since participants are at their third semester of undergraduate studies and are assumed to be

at a low intermediate or intermediate level. This result supports Taylor's (2002) finding that the level of the learner makes a difference when it comes to the effect of L1 on L2 reading comprehension. He states, "Studies with second-year learners as participants yielded the largest cumulative effect size" (p. 145). In addition, Ko (2005) believes that L2 glosses can be more effective to learners than L1 glosses if the level of learners is high.

The second research question compared different types of glossing in terms of their effect on L2 reading recall. This recall protocol test is a kind of productive tests, which are believed to give more precise measures of differences in reading comprehension and insight into what the reader comprehended of the text (Taylor, 2006). Results showed that participants with L1 glosses or no glosses recalled more ideas than participants with L2 glosses did. This is also explained through the level of participants. The L2 glosses may not be effective in promoting reading comprehension or idea recalling (Ko, 2005). Therefore, L1 glosses may be more effective to participants with low proficiency level.

The third research question asked if L2 learners had different preferences for gloss types. As shown in table 7 above, more than 94% of participants preferred having glosses: 44% wanted L1 (Arabic) glosses, and 50% wanted L2 (English) glosses. Participants' preference of having glosses, regardless of the language of the gloss, is consistent with the result of Ko (2005). More participants preferred to have L2 glosses than L1 glosses in both studies.

Why did participants recall fewer ideas and answer fewer questions on one hand, and prefer to have L2 glosses on the other hand? One possible explanation may lie in the proficiency of participants themselves. Proficiency level might have played a role here since participants' level is low intermediate or intermediate and, therefore, L2 glosses may be more appealing to them. In previous studies, Jacobs et al. (1994) and Bell and LeBlanc (2000) had participants in their second year. Ko (2005) had participants in their first year. In this study, participants were in their second year. Further research might be conducted with participants of different levels of proficiency in order to connect their proficiency and their preference in glosses.

### **Conclusion:**

The current study takes a further step toward studying the effect of L1 (Arabic) glosses, L2 (English) glosses, and no glosses on reading comprehension. It has shed some light on how some Saudi students deal with different types of glossing.

Although it has been conducted on male learners at an educational institution in one city of Saudi Arabia, it can provide a starting point for research on the effect of using these types of glosses on reading comprehension by Saudi students. Three groups of learners studied an English text with L1 (Arabic) glosses, L2 (English) glosses, and no glosses. Results of the immediate multiple-choice reading comprehension test and recall protocol showed that participants who read the text with L1 (Arabic) glosses answered more questions and remembered more ideas than other participants did. In turn, participants who read the text with L2 (English) glosses answered fewer questions and remembered fewer ideas than other participants did. Statistically significant differences occurred between L1 and L2 glosses conditions as far as number of correct answers is concerned, and between L1 and L2 glosses conditions and L2 and no glosses as far as the number of t-units recalled is concerned.

The findings in this study suggest a number of implications that need to be taken into consideration. The finding that the differences between the L1 and L2 means were significant in the number of correct answers suggests considering the use of L1 glosses in reading materials introduced to beginners and intermediate level learners more than to advanced learners. Teachers and instructors need to prepare L2 reading materials with the help of L1. Moreover, they need to take into consideration the language and quality of comprehension aids in textbooks.

Although this study addresses a number of issues regarding different types of glossing, there are still other issues that need more investigation to provide more insights into this topic. The current study suggests a number of steps that help to further explore the issue of L1 and L2 glosses. Since this study only tested participants immediately

after reading the text, further research might consider testing participants over longer periods of time to investigate the advantage of L1 glosses over L2 or no glosses. This study had college-level participants. Further research should be conducted on learners of higher levels. Also, similar research can be conducted with learners at lower levels.

The current study had participants from one school in Saudi Arabia. In order to be able to generalize the findings on Saudi students, more students from different areas of the Kingdom of Saudi Arabia should be involved in similar studies.

Since this study was conducted on male learners only, further research might be conducted on female Saudi learners.

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