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Impact of Highlighting Techniques on the Retention of Unfamiliar Words in L2 Classrooms

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Abstract

Since L2 learners cannot learn the mass of words potentially available to them, it would be more useful to teach them specific strategies for dealing with unfamiliar words. One possible solution these days is to provide learners with useful guidance by which they can tackle the problem efficiently. However, the question is how much noticing in the input may result in the acquisition and retrieval of information concerning unfamiliar words. Accordingly, the present essay sought to investigate the extent to different types of highlighting techniques can improve the retention of unfamiliar words by L2 learners. To this end, from the population of first graders studying at a boys and a girls high school a sample of 240 pre-intermediate students (120 girls and 120 boys) were randomly selected based on their scores on an OPT test. Intended words for the experiment were selected through a pre-test containing vocabulary items which were unknown to the participants. Using these words, a reading text with three passages each containing 30 words unknown to the participants was given to the targeted participants. The new, unfamiliar words were highlighted for the experimental groups (by color for the first group, underlined for the second group and written in italics for the third group). Apparently, no highlighting techniques were used for the control groups. Persian translations of the new words were also provided given at the end of the passage. To measure the acquisition of unfamiliar target words three types of tests; namely, recall, recognition, and comprehension tests were administered twice-one immediately after reading passages and the other two weeks later. The findings revealed that the retention of the words was significantly higher in experimental groups than that of the control groups. More specifically, the retention of the words was not only significantly higher in underlining group compared to other types of highlighting techniques but it also was meaningfully higher in both immediate and delayed tests for the experimental groups compared to those in the control groups. Notably, participants performed better in recognition than the recall test and the results did not show any interaction between retention of unfamiliar words and gender.

Key words: Recall; Recognition; Retention; Comprehension; Highlighting; Memory

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INTRODUCTION

Attention to the form of the input is on much of the recent SLA research focus (Fotos, 1993; Robinson, 1995; Schmidt, 1990, 1993; Laufer & Hill, 2000). There is growing research evidence that L2 learning is impossible without attention to the input in the sense of "noticing" it. Though attended learning is discussed in relation to syntax, vocabulary learning is no exception to the attention requirement. Cognitive psychologists and language scholars working within the framework of cognitive psychology believe that retention of information is determined by the way in which this information is processed (Ellis, 1994a; Mondria & Wit-de-Boer, 1991; Watanabe, 1997). In this regard Hulstijn and Laufer (2001) suggested that the more a learner pays attention to a word's morphophonological, orthographic, prosodic,

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semantic and pragmatic features and to intraword and interword relations, the more likely it is that the new lexical information will be retrieved. A number of researchers have recently examined the fruitfulness of different techniques of vocabulary instruction (Rott, Williams, & Cameron, 2002; Singleton, 2008; Min, 2008; Mizumoto & Kansai, 2009; File & Adams, 2010). "There is a great divide between what we know about vocabulary instruction and what we (often, still) do" (Greenwood, 2004, p.28).

From the cognitive perspective, one of the most frequently used variables involved in learning is memory. Memory is a necessary part of the learning process without which experiences would be lost and we could not benefit from them. Therefore it seems reasonable that as language teachers we should pursue ways of enhancing memory capacity, which will ultimately lead to better learning. Researchers believe that in L2 learning, incidental acquisition-through-reading is a slow process with small vocabulary gains (Horst, Cobb, & Meara, 1998; Hulstjin, Hollander, & Greidanus, 1996; Laufer, 2005; Nation, 2001; Read, 2004). It is beneficial to repeat a word immediately after its initial encounter for better learning (Baddeley, Hulstijn, & Nation, 2001). Peters (2007b) did research to see if word relevance had an effect on immediate and delayed recall of word meanings. Laufer (2001, 2003, 2005) compared reading accompanied with word-focused activities and found that the word-focused activities always had better vocabulary learning gains than reading only.

Different studies in second language learning field used different enhancement techniques in language learning and vocabulary learning (Peters, Sercio, Hulstijn, & Lutieharms, 2009; Nemati, 2013, 2009; Wharton, 2000; Vandergrift, 2002; Takeuchi, 2003) including strategies applicable to teaching in L2 learning environment focusing on the memory processes done by second language learners. Furthermore, it is assumed that more proficient language learners use a greater variety and often a greater number of learning strategies (Lee & Oxford, 2008; O'Malley & Chamot, 1990; Wharton, 2000). The most popular we can mention here are the use of index cards, a mixture of card games, colored pens, and sticky notes (Mercer, 2005). In another article Nemati (2009) focused on just memory strategies and its effect on long term retention. Mnemonic devices are also used to improve memory. Mnemonics as defined by Searlman and Herman (cited in Greoger, 1986) refers to" the use of internal strategies or methods to make it easier to encode, store and/or retrieve information" (p.246). Mnemonics or "memory-aiding strategies" are basic kinds of association or strategies that learners use in order to increase the retention and recall of lexical items (Carney & Levin, 2004). One such task is the use of different types of highlighting techniques (e.g. use of color, underlining, and italics) in various reading assignments.

There are different techniques for highlighting. A passage can be highlighted by the use of different types of highlighting one of which is the use of color (Dzulkifli & Mustafar, 2013; Veron & Lloyd-Jones, 2003; Lloyd-Jones & Nakabayashi, 2009), underlining and writing in italics (Chun & Plass, 1994; Luppesku & Day, 1993; Lyman-Hanger & Davis, 1996; Lyman-Hanger, Davis, Burnett, & Chennault, 1993; Mondaria, 1993). Color is believed to be the most important visual experience to human beings (Adams & Osgood, 1973). It functions as a powerful information channel to the human cognitive system and has been found to play a significant role in enhancing memory performance (Wichmann, Sharpe, & Gegenfurtner, 2002). The extent to which students utilize their cognitive abilities is also important and may contribute to better academic achievement (Mariam & Intan, 2012). More experimental works exploring the influence of color on the human cognitive processes, were conducted since then (Pan, 2012; Smilek, Dixon, Cudahy, & Merikle, 2002; Spence, Wong, Rusan, & Rastegar, 2006).

One of the most important phases in vocabulary learning which needs to be considered more deeply is to check the results of retrieval of vocabulary knowledge through the use of these techniques that is the concern of this study. More specifically, the present study sought to answer the following questions:

RQ1: Is the retention of highlighted words different from unhighlighted words?

RQ2: Among three types of highlighting techniques used in this study, which one is more effective?

RQ3: How does highlighting vocabulary affect short term and long term memory?

RQ4: Is there any difference between the results of recognition, recall and comprehension tests in girls and boys regarding the use of highlighting techniques?

RQ5: Is there any difference between males and females regarding the use of highlighting techniques?

1. METHOD

In order to investigate the retrieval of vocabulary knowledge in two groups of high school boys and girls, an experimental task was done where three types of highlighting techniques (use of color, underlining and writing in italics) for three experimental groups and no highlighted for the control group was performed. Incidental tests of recall and recognition (immediate and delayed) and a comprehension test were employed after the experiment.

1.1 Participants

The study was carried out in two schools (boys and girls) in one among the five educational districts of Isfahan which had the highest number of first year grade students taking an English course of four hours a week for a whole

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academic year voluntarily participated in the study. It is noteworthy that OPT was used in order to assess their level of proficiency and make them homogenous. Those students who scored between 120 and 130 were selected as pre-intermediate according to the attached schedule to the OPT. After determining the homogeneity of subjects they were administered a pre-test consisting of 160 vocabulary items where they were asked to write the meaning of the words in their L1. So 240 students (120 girls and 120 boys) who got between 120 and 130 from OPT and did not know the words under question were selected. The pilot group considered for the study was a class containing 20 students. Appropriateness of the OPT and recall, recognition and comprehension tests were tested in this group. The appropriateness of the passage and the time for reading the passage and performing the test were checked in this group.

1.2 Materials

Different materials were used throughout the study for treatment and testing the students' performances.

1.2.1 Proficiency Test

Oxford Placement Test (OPT) consisted of 200 items of listening and grammar, a written multiple-choice test in the range elementary to advance was used. Scores ranges between 120 and 130 were considered as pre-intermediate according to the attached schedule to OPT.

1.2.2 Vocabulary Pre-Test

A list of 160 new vocabulary items found in the second year English textbook which were considered to be unknown or possibly difficult was prepared and given to the participants in all groups as the pretest. Participants were supposed to write the meaning of the words that they knew.

1.2.3 Vocabulary Post-Tests (Immediate and Delayed)

Vocabulary posttest included three parts (recall, recognition and comprehension tests) and was given twice to the students, once immediately after reading the passage and another after two weeks in order to test the results of the study for a longer period of time.

1.2.4 The Comprehension Test

The comprehension test was applied only immediately after the instruction to be sure that learners have really understood the passage and their correct responses in recall and recognition tests were not by chance.

1.3 Procedure

In order to obtain the purpose of the study, the following procedure was followed: Two schools (boys and girls) in one among the five educational districts of Isfahan which had the highest number of first year grade students taking an English course of four hours a week for a whole academic year were selected for the study. It is noteworthy that OPT was used in order to assess students' level of proficiency and make them homogenous. Those students who scored between 120 and 130 were selected as pre-intermediate according to the attached schedule to the OPT. After determining the homogeneity of subjects they were administered a pre-test consisting of 160 vocabulary items where they were asked to write the meaning of the words in their L1. So 240 students (120 girls and 120 boys) who got between 120 and 130 from OPT and did not know the words under question were selected. We made three experimental groups and one control group out of the participants each consisting of 30 members. We had also a pilot group. The pilot group considered for the study was a class containing 20 students. Appropriateness of the OPT and recall, recognition and comprehension tests were tested in this group. The appropriateness of the passage and the time for reading the passage and performing the test were checked in this group.

As the next step, a list of 160 new vocabulary items found in the second year English textbook which were considered to be unknown or possibly difficult was prepared and given to the participants in all groups as the pretest. Participants were supposed to write the meaning of the words that they knew. To score the pre-test, a 1 mark was considered for the words which were answered correctly by the learners and a 0 mark for the words answered wrongly. We prepared a reading comprehension passage based on the unfamiliar words for the participants based on the results of the pre-test. The participants then were asked to read the passage. New words of the passage were highlighted by color for the first experimental group, underlined for the second and written in italics for the third one. No highlighting technique was performed for the control group. After giving the reading comprehension passage to the participants and giving appropriate time for learning to take place (20 minutes), the texts were collected. By giving the text to the pilot group we found that the average time for finishing the passage while learning the new words was 20 minutes. So we gave students 20 minutes in order to read the passage.

After finishing the time of reading the passage, the texts were collected and subjects were given a blank sheet where they were asked to write down every new word they remembered from the text as the immediate recall test. We emphasized that they should write the exact word. 15 minutes was considered for this phase. After the recall test, a recognition test was applied to the participants. It consisted of a set of 60 words and students were asked to choose and circle the new words that they had in the passage. Among the 60 words, there were 30 words which they had learned in the study, every correct choice received one mark out of 60. The time limit for this test was 10 minutes. At the end, a test of comprehension was applied to all groups. It consisted of two parts: The first 5 questions were T/F questions for which they had to read the sentences and use T for correct sentences and F for wrong sentences. The aim of this test was to make sure

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that participants had completely understood the passage and their answers in the previous tests were not by chance. For doing this part, subjects were given 15 minutes. The scoring of the comprehension test was in this way that one mark was assigned to the correct response and zero for the false answer. At the end of the session nothing was said about the delayed post-test that would be took place two weeks later. So, students were not aware that their learning would be tested again later. After two weeks on the same testing procedure was followed and the tests of recall and recognition were given to the participants in order to check their vocabulary retention after two weeks. The procedure above was similarly performed for boys too.

2. RESULTS

At this stage, the statistical findings are analyzed and interpreted in order to find out whether the use of highlighting techniques produced any statistically significant impact on retrieving new words in the experimental groups or not. To accept or reject the stated hypotheses, the scores from the pre-test and post-tests were analyzed in different steps. A number of two-way ANOVAs were performed in order to identify whether any statistical difference(s) could be observed to be the basis for drawing conclusions. Furthermore, a Scheffe post hoc test was run in order to find out the significant difference(s). The level of significance at which the hypotheses in this study were tested was 0.05.

2.1 Addressing Hypothesis Number One

Hypothesis number 1: There is a significant difference in the mean retention of highlighted words and unhighlighted ones. Two-way ANOVAs were performed with the dependent variable the mean scores on the immediate vocabulary post-test. Table 1 and 2 show the mean differences in 4 groups of participants related to the observed means of boys' and girls' scores.

Table 1
Observed Means of Boys' Scores

Groups	Control group	Mean difference	Sig.
1	4	1.78*	.000
2	4	1.40*	.000
3	4	.62*	.004

Note. 1. Highlighted group by color
2. Highlighted group by underlining
3. Highlighted group by writing in italics
4. Unhighlighted group

The results of the ANOVA for boys are reported in Table 1. It shows the difference between the means of the immediate post-test in 3 experimental groups (1, 2, and 3) and one control group (4). There is a significant main effect for the 3 experimental groups compared to the control group. The results show that participants remembered highlighted word better than unhighlighted ones. The mean difference in the retention of those words highlighted by colors compared to the unhighlighted ones is 1.78 and significant level at 0.00, underlining technique compared to the unhighlighted is 1.40 and highly significant level at 0.00, and written in italics technique compared to the unhighlighted ones is 0.62 and significant level at 0.004. Therefore, the main hypothesis was confirmed, i.e., every experimental group scored significantly higher than the control group on the immediate retention test.

Table 2
Observed Means of Girls' Scores

Groups	Control group	Mean difference	Sig.
1	4	.22	.737
2	4	.64*	.019
3	4	.1684	.878

Note. 1. Highlighted group by color
2. Highlighted group by underlining
3. Highlighted group by writing in italics
4. Unhighlighted group

Table 2 shows the results of the immediate post-test in girls. The mean difference of the immediate post-test in three experimental groups (1, 2, and 3) and one control group (4) has been reported in Table 2. The mean difference of the retention of those words highlighted by color compared to the unhighlighted ones is 0.22 (0.737, not significant), highlighted by underlining compared to the unhighlighted ones is 0.64 and significant at 0.019, highlighted by written in italics technique compared to the unhighlighted ones is 0.16 (0.878, not significant). The results show that the retention of the highlighted words compared to the unhighlighted ones is better, although the mean difference in the first and the third experimental groups of girls is not significant.

2.2 Addressing Hypothesis Number Two

Hypothesis number 2: There is a significant difference among three types of highlighting techniques regarding the retention of the words. To test this hypothesis, we followed the same route as used for testing hypothesis number 1, and again a number of two-way ANOVAs were performed with the dependent variable and the mean scores. Table 3 shows the mean difference of the three types of highlighting in girls and boys. The values of mean differences show that there is a statistical difference among the three groups with respect to the dependent variable (three types of highlighting techniques). The difference between the first type of highlighting techniques (color) compared to the second type of highlighting (underlining) is significant level at 0.02 and shows that underlining on the whole was better than color. Comparing the first type of highlighting technique (color) to the second type(underlining) again shows that the difference is significant level at 0.00 and those having color as the highlighting technique did

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better than those with writing in italics. Comparing the second type of highlighting technique (underlining) with the third type of highlighting (writing in italic), a significant difference between the mean scores of the three types of highlighting was found and those having underlining technique did the best. There was a significant difference between the three types of highlighting techniques.

Table 3
The Mean Difference of the Three Highlighting Techniques in Girls and Boys

Highlight	Highlight	Mean difference (I-J)	Sig.
1	2	-.41*	.022
3		1.86*	.000
2	1	41*	.022
3		2.27*	.000
3	1	-1.86*	.000
2		-2.27*	.000

Note. 1. Highlighted group by color
2. Highlighted group by underlining
3. Highlighted group by writing in italics

2.3 Addressing Hypothesis Number Three

Hypothesis number 3: The retention of the words is the same in short and long term memory. In testing the hypothesis number 3, ANOVA was used with dependent variable the mean scores on the immediate and delayed post-tests. The descriptive statistics regarding the results of the immediate and delayed post-tests have been reported in Table 4. The values show that there is a statistically difference among the groups with respect to the dependant variable.

Table 4
The Results of the Immediate and Delayed Post-Tests in Boys and Girls

High_TIM	High_TIM	Mean	Std.deviation	*N*
1	1	7.76	1.63	120
	2	7.33	1.58	120
	3	7.07	1.88	120
2	1	5.41	1.79	120
	2	4.64	1.25	120
	3	3.7.	1.07	120

Note. TERM-TIME
1. Short-term
2. Long-term

HIGH-TIME
1. Highlighted by color
2. Highlighted by underlining
3. Highlighted by writing in italics

Total results are as follows: the mean score of the highlighted groups by color in immediate and delayed post-tests are 7.76 and 5.64 respectively. The mean score of the underlined groups in immediate and delayed post-tests are 7.33 and 4.64 respectively. The mean score of the writing in italics groups in immediate and delayed post-tests are 7.07 and 3.73 respectively. Table 5 shows the effect of three types of highlighting techniques in the results of the independent variables in this study. There is a highly significant difference in the performances of participants in immediate and delayed post-tests (sig. at 0.000).

Table 5
The Effects of Three Types of Highlighting Considering the Time of Testing

Source	Type ||| sum of squares	*df*	Mean square	*F*	Sig.
Sex_time	.26	1	.26	.10	742
Term_TIM	1408.84	1	1408.84	573.53	.000
High_TIM	169.23	2	84.61	34.44	.000
Sex_TIME* Term_TIM	.16	1	.16	.06	.798
Sex_Time*High_TIM	1.64	2	.82	.33	.716
TERM_TIM* HIGH_TIM	30.13	2	16.06	6.13	.002
SEX_TIME* TERM_TIM* HIGH_TIM	4.29	2	2.14	.87	.418
Error	1739.15	708	2.45		
Total	29225.27	720			
Corrected total	3353.73	719			

Hypothesis number 3 is therefore accepted because there were significant differences between the results of the immediate and delayed post-tests. Students were able to remember the words immediately after the experiment better than after two weeks.

2.4 Addressing Hypothesis Number Four

Hypothesis number four: There is a significant difference between the retention of words in the males and females regarding highlighting techniques. Table 6 shows the descriptive statistics of the performances of the participants regarding highlighting techniques while discriminating the mean results of girls and boys in order to test hypothesis number 4.

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Table 6
Dependent Variable: SCORE_SEX (Descriptive Statistics)

Highligh	sex	Mean	Std.deviation	*N*
1.00	1.00	8.40	1.55	90
	2.00	7.83	1.69	90
2.00	1.00	8.61	.89	90
	2.00	8.44	1.22	90
3.00	1.00	6.23	1.37	90
	2.00	6.27	1.59	90

Note. 1. Highlighted by color
2. Highlighted by underlining
3. Highlighted by writing in italics

SEX
1. Males
2. Females

The mean of the boys' scores having color as the highlighting technique is 8.40 and that of girls' is 7.83 which show that boys have performed better than girls regarding color as the highlighting technique. The mean of the boys' performances in underlining technique is 8.61 and for girls it is 8.44. Here again boys have performed better when they had underlined as the highlighting technique. Comparing the mean scores of girls and boys when they had to write in italics as the highlighting technique, we find 6.23 for boys and 6.27 for girls. In order to identify the differences in the results of girls' and boys' performances a two-ways ANOVAs were performed. Table 7 shows the whole results of the two-ways ANOVA regarding the independent variable.

Table 7
The Difference Between Males' and Females' Performances Regarding the Use of Highlighting Techniques

Source	Type ||| sum of squares	*df*	Mean square	*F*	Sig
Highligh	528.92	2	264.46	131.76	.000
Sex	7.42	1	7.42	3.69	.055
Highligh*sex	8.395	2	4.19	2.09	.125
Error	1071.82	534	2.00		
Total	33089.72	540			
Corrected total	1616.57	539			

It shows that the difference between three types of highlighting techniques is highly significant at 0.00 level and also the difference between two genders' performances is highly significant at 0.05. Comparing two types of genders' performances with the three types of highlighting techniques, we find no significant difference (0.125) which shows that sex had no effect on the retention of unfamiliar words regarding the use of highlighting techniques. So the hypothesis number 4 is rejected that there is a significant difference between males and females regarding highlighting techniques.

2.5 Addressing Hypothesis Number Five

Hypothesis number five: There is a significant difference in the results of recall, recognition and comprehension tests in boys and girls, regarding the highlighting techniques. Descriptive data of the boys' performances in those tests have been conducted in table 8.

Table 8
Descriptive Statistics of Boys' Regarding Recall, Recognition and Comprehension Tests

Tests	Groups	Mean	Std.deviation	*N*
1	1	8.96	1.29	30
2		9.13	1.16	30
3		7.10	1.32	30
4		6.20	.99	30

Note. Tests
1. Recall
2. Recognition
3. Comprehension
4. Unhighlighted group

Groups
1. Highlighted by color
2. Highlighted by underlining
3. Highlighted by writing in italics

The mean of the boys' performances who had color as the highlighting technique in recall test is 8.96, in underlining group it is 9.13 and in writing in italics group the mean is 7.10 all in the recall test. The mean of the boys' performances in the unhighlighted group in recall test is 6.20. The same results of the boys' performances in recognition tests are 8.96 for those who had color as highlighting technique, 8.34 for the underlining group, 8.54 for those in writing in italics group and 7.81 for those boys in the unhighlighted group. The mean of the boys' performances in comprehension test is 6.84 for the color group, 6.18 for the underlining group and 5.67 for the italics group. The mean of the boys' performances in the unhighlighted group in comprehension test is 5.42. Descriptive data of the girls' performances in recall, recognition and comprehension tests are conducted in Table 9.

Table 9
Descriptive Statistics of Girls' Performances Regarding Recall, Recognition and Comprehension Tests

Tests	Groups		Std.deviation	*N*
1	1	6.93	1.43	30
	2	8.63	1.77	30
	3	7.93	1.46	30
	4	8.36	1.40	30
2	1	8.32	1.65	30
	2	8.52	.91	30
	3	8.48	1.01	30
	4	7.90	1.14	30
3	1	6.93	1.62	30
	2	6.29	1.49	30
	3	4.58	1.40	30
	4	5.23	.70	30

Note. Tests
1.Recall
2. Recognition
3. Comprehension
4. Unhighlighted group

Groups
1. Highlighted by color
2. Highlighted by underlining
3. Highlighted by writing in italics

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The mean of the girls' performances who had color as the highlighting technique in recall test is 6.93, in underlining group it is 8.63 and in writing in italics group the mean is 7.93 all in the recall test. The mean of the girls' performances in the unhighlighted group in recall test is 8.36. The same results of the girls' performances in recognition tests are 8.3233 for those who had color as the highlighting technique, 8.52 for the underlining group, 8.48 for those in writing in italics group and 7.90 for those girls in the unhighlighted group. The mean of their performances in comprehension test is 6.93 in color group, 6.29 in underlining group and 5.58 in italics group. The mean of the girls' performances in the unhighlighted group in comprehension test is 5.23. The results of two-way ANOVAs have been conducted in tables 4.10 and 4.11 respectively for boys and girls.

Table 10
The Results of the Two Way ANOVAS for Boys in Recall, Recognition and Comprehension Tests

Source	Type ||| sum of squares	*df*	Mean square	*F*	Sig
Tests	371.00	2	185.50	143.76	.000
Groups	171.77	3	57.25	44.37	.000
Tests*groups	69.88	6	11.64	9.02	.000
Error	449.01	348	1.29		
Total	20953.86	360			
Corrected total	1061.67	359			

It shows that the difference between the three tests is significant level at 0.000. The difference between the groups of the participants as it was found before is also significant and the difference between the groups of participants and the types of tests is highly significant level at 0.000 for boys. The same results were found for girls' performances in recall, recognition and comprehension tests (Table 11).

Table 11
The Results of the Two Way ANOVAS for Girls in Recall, Recognition and Comprehension Tests

Source	Type ||| sum of squares	*df*	Mean square	*F*	Sig
Tests	368.23	2	184.11	97.97	.000
Groups	20.51	3	6.83	3.63	.013
Tests*groups	88.53	6	7.85	7.85	.000
Error	653.97	348			
Total	21004.27	360			
Corrected total	1131.25	359			

In order to identify exact place of significant difference(s) the results of the three types of tests through a Scheffe post hoc test have been reported in tables 12 and 13 respectively for boys and girls. The point is that the differences among three types of tests are significant level at 0.000 that is highly significant. It was found that those students in the colored and underlined groups performed better in recognition tests than in recall tests.

Table 12
Results of Comparing the Three Types of Tests for Boys (Scheffe)

Test	Test	Mean difference	Sig.
1	2	-56*	.001
	3	1.81*	.000
2	1	.56*	.001
	3	2.37*	.000
3	1	-1.86*	.000
	2	-2.37*	.000

Note. Tests
1. Recall
2. Recognition
3. Comprehension

It shows that the difference between the recall and recognition tests for boys is significant level at 0.001.

Table 13
Results of Comparing the Two Types of Tests for Girls (Scheffe)

Test	Test	Mean difference	Sig.
1	2	-.34	.015
	3	1.95*	.000
2	1	-34	.015
	3	2.29*	.000
3	1	-1.95*	.000
	2	-2.29*	.000

Note. Tests
1. Recall
2. Recognition
3. Comprehension

It shows that the difference between recall, recognition and comprehension tests for girls is significant level at 0.015.

DISCUSSION

The goal of this research project was to examine the effect of highlighting techniques on the retention of unfamiliar words in English language learners. We began the study first by examining the differences between the retention of highlighted words and unhighlighted ones and found that the retention of highlighted words for the

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experimental groups was better and the participants in the unhighlighted groups performed worse. The results concerning the vocabulary acquisition are not surprising. As Mondria and Wit-de Boer (1991) found, more attention toward the link between form and meaning leads to better retention of the foreign word. Similar findings were reported by Beaton, Gruneberg, & Ellis (1995) who examined the retention of foreign language vocabulary learning through the use of the key-word method during ten years of study. The similarity of our study to that of Mondria and Wit-de Boer (1991) is focusing on the retention of the foreign words after a particular time and what it makes it similar to the study by Beaton, Gruneberg, and Ellis (1995) is twofold: first both have focused on the vocabulary learning and second they are concerned with the retention of the words.

Studies based on noticing hypothesis (Fotos, 1993; Robinson, 1995; Schmidt, 1990) also emphasized the beneficial effects of increased attention and conscious awareness of the link between form and meaning. Increased attention in this study was attained through a visible link to the target group, which made the target vocabulary items more salient. The effect of salience of vocabulary items was noticed previously by Brett (1997, 1998) in studies on listening comprehension. In our case, the participants in the experimental groups received the passage with highlighted new words. This type of technique ensured its better acquisition as measuring immediate as well as delayed posttests. Our results also brought evidence that our findings in the experimental groups (both in girls and boys) were significantly different compared to those in the control groups and the differences were highly significant.

These findings are in line with Nist and Hogrebe's (1987) idea who believed that students have to highlight the materials if they want to have an increase in the recall of those materials. The results are also consistent with Hunt and Buglar's (1999) statement when they said that the association of a visual image with a word helps the learner remember the word. Here, highlighting technique works like the image in Kosslyn's (1980) view who believed that images may be important to learn in enabling learners to represent what is not depicted in instruction and then to transform these representations to facilitate comprehension and problem solving. It is also consistent with what Levin (1983) proposed that visual aids can function in the same way particularly for learners with poor verbal skills.

As Celce-Murica (2001) examined and found in her study, if there is a harmony between the student in terms of style and strategy performances and the instructional methodology and materials then the student is likely to perform well. Reid (1995) and Ehrman (1996) believed that there are some styles performances considered to be relevant and useful to understand the process of learning the first of which was its being visual. Highlighting techniques used in this study had this characteristic of being visual and this visuality can be one reason that why participants in highlighted groups performed better than those in the unhighlighted groups. Also, according to Wundt (1918) our visual sense is the sharpest and the best developed sense and that thinking without concrete images is impossible.

The results of our study also confirms Hulstijn's (2001) findings in that the more a learner pays attention to a word's morphophonological, orthographic, prosodic, semantic, and pragmatic features, the more likely it is that the new lexical information will be retained. According to the encoding specifity principle (Thomson & Tulving, 1970), the same cues that are available to learner to facilitate encoding, will also serve as the best retrieval cues for that information at test time. Cooper (1998) mentioned that there is a close relationship between retrieval and other stages that is the more ways available for information to be encoded, the more ways there are for retrieving it. Gorins and Redman (1986) also confirmed that our memory for visual images is extremely reliable and there is little doubt that objects and pictures can facilitate memory. They believed that association of a visual image with a word helps learner remember the word. All these reasons confirm our findings of what a great effect has highlighting techniques as a visual technique on increasing retention of the unknown words.

On the surface the results of this study regarding the use of highlighting techniques, contradict the conclusions drawn by Hershberger (1964) who found that highlighting did not increase the learning of enrichment or essential texts. The results of our study are also against Wade and Trathen's views (1964) that supported Hershberger's statement that by pre-highlighting material, recall of that material will not be increased. It also contradicts DeRidder's (2002) findings about the effects of visible and invisible hyperlinks on vocabulary acquisition and reading comprehension. She asked the question that if highlighting of hyperlinks affect incidental vocabulary learning, text comprehension, and the reading process but did not find any significant difference between the performance of the visible links and invisible link groups.

In this study we also looked to find if the results of the three types of highlighting techniques are different or not. The findings showed that there are statistically significant differences among the three types of highlighting techniques. There were researches related to the use of underlining and coloring new words (Kido, 2000; Goldstein, 2002), who looked for psychological effects of colors on learning. We took a step further and analyzed the effects of color, underlining, and writing in italics distinctively and found that among three types

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of highlighting techniques, underlining was better in girls and boys on the whole, although the results of boys' performances were better when they used color as a highlighting technique. The retention of new words was benefited mostly by using underling the words, confirming Goldstein (2002) and Kido's (2000) results on the use of underlining and coloring. One reason why girls' results in the use of color were not as good as boys may be that these learners did not like this kind of color. A reason that why those students in italics groups were not able to retrieve the words as much as those in underlining and color groups may be that writing in italics made the new words less attractive.

The findings related to the results of the recognition and recall tests showed that participants performed better in recognition tests than in recall. As Cariana and Lee (2001), Glover (1989), McDaniel and Mason (1985) found before, selecting the correct response is much easier than producing a response from memory. Another study by Miremadi and Kassaian (2005) confirms the results of our study regarding the result of recognition and recall tests, where they found that recognition test was superior to recall at all levels of language proficiency. They used recall and recognition tests of memory for measurement o the retained terms. Our findings are also consistent with the previous studies in the literature stating that recognition test of retained information leads to better performance than a recall test, e.g., of MacDougal (1904), Postman, Jenkins, and Pastman (1948), Postman (1950) and Jourabchi (1994).

CONCLUSION

The present study investigated the effect of three types of highlighting techniques (use of color, underlining and writing in italics) on the retention of unfamiliar words measured by two tests of recall and recognition. Clearly, highlighting is used to emphasize or to make something more prominent. It is an active process which helps make reading active rather than a passive process. Therefore, encouraging students to highlight difficult words can be very useful when reading a passage. Highlighting is not limited to the words; students can highlight difficult parts of spelling words, regular or irregular verbs, or whatever the lesson is accentuating. There are many good reasons to get the students to highlight words which they do not know while they are reading. The most obvious is that highlighting allows the teacher to find out which words students do not know. It also leaves a record which can be rewarding to the students because they can re-read them paying attention to highlight words. Many people use highlighting to make it easier to review material, especially for exams. Highlighting is also a good way of picking out specific language within a text that you may want to cite or quote in a piece of writing.

REFERENCES

Adams, F. M., & Osgood, C. E. (1973). A cross-cultural study of the affective meaning of color. *J Cross Cult Psychol*, *4*(2), 135-156.

Mariam, A. D., & Intan, A. A. (2012). Students of low academic achievement—Their personality, mental abilities and academic performance: How counsellor can help? *Int J Hum Soc Scie*., *2*(23), 220-225.

Dzulkifli, M., & Mustafar, M. (2013). The influence of colour on memory performance: A review. *The Malaysian Journal of Medical Sciences, 20*(2), 3.

Ellis, N. C. (1994a). Consciousness in second language learning: Psychological perspectives on the role of conscious processes in vocabulary acquisition. *AILA Review, 11,* 37-56.

File, K. A., & Adams, R. (2010). Should vocabulary instruction be integrated or isolated*? TESOL Quarterly, 44*(2), 222-249.

Fotos, S. (1993). Consciousness-raising and noticing through focus on form: Task performance versus formal iinstruction. *Applied Linguistics, 14,* 385-407.

Greenwood. (2004). *Words count: Effective vocabulary instruction in action*. Scott C.

Horst, M., Cobb, T., & Meara, P. (1998). Beyond a clockwork orange: Acquiring second language vocabulary through reading. *Reading in a Foreign Languag*, *11,* 207-223.

Hulstijn, J. H., Hollander, M., & Greidanus, T. (1996). Incidental vocabulary learning by advanced foreign language students: The Influence of marginal glosses, dictionary use, and reoccurrence of unknown words. *The Modern Language Journal, 80,* 327-339.

Hulstijn, J. H., & Laufer, B. (2001). Some empirical evidence for the involvement load hypothesis in vocabulary acquisition. *In Language Learning, 51*(3), 539-58.

Laufer, B. (2001). Reading, word-focused activities and incidental vocabulary acquisition. *Prospect, 16*(3), 44-54.

Laufer, B. (2003). Vocabulary acquisition in a second language: Do learners really acquire most vocabulary by reading? Some Empirical Evidence. *Canadian Modern Language Review, 59,* 565-585.

Lee, K. R., & Oxford, R. (2008). Understanding EFL learners' strategy use and strategy awareness. *Asian EFL Journal, 10*(1), 7-32.

Lloyd-Jones, T. J., & Nakabayashi, K. (2009). Independent effects of color on object identification and memory. *Q J Exp Psychol*., *62*(2), 310-322.

Luppesku, S., & Day, R. (1993). Reading, dictionaries, and vocabulary learning. *Language Learning*, *43*(2), 263-287.

Lyman-Hager, M., & Davis, J. N. (1996). The case for computer-mediated reading: Une vie de boy. *The French Review, 69*(5), 775-790.

Lyman-Hager, M., Davis, J. N., Burnett, J., & Chennault, R. (1993). Une vie de boy: Interactive reading in French. In F. L. Borchardt & E. M. T. Johnson (Eds.), *Proceedings of the CALICO 1993 annual symposium on "assessment"* (pp.93-97). Durham, NC: Duke University.

Copyright © Canadian Academy of Oriental and Occidental Culture

Mercer, N. (2005). Sociocultural discourse analysis: Analysing classroom talk as a social mode of thinking. *Journal of Applied Linguistics, 1*(2), 137-168.

Min, H.-T. (2008). EFL vocabulary acquisition and retention: Reading plus vocabulary enhancement activities and narrow reading. *Language Learning, 58*(1), 73-115.

Mizumoto, A., & Kansai, O. T. (2009). Examining the effectiveness of explicit instruction of vocabulary learning strategies with Japanese EFL university students. *Language Teaching Research, 13*(4), 425-149.

Mondria, J.-A., & Wit-de Boer, M. (1991). The effects of contextual richness on the guessability and the retention of words in a foreign language. *Applied Linguistics, 12*(3), 249-267.

Mondria, J.-A. (1993). *The effects of different types of context and different types of learning activity on the retention of foreign language words*. Paper Presented at the 10th AILA World Congress of Applied Linguistics, Amsterdam.

Nation, ISP. (2001). *Learning vocabulary in another language.* Cambridge University Press.

Nemati, A. (2009). Enhancing long-term retention by memory vocabulary learning strategies. *Asia TEFL Journal*, *7*(1), 171-192.

Nemati, A. (2013). Increasing depth of vocabulary: A hidden aspect of vocabulary knowledge. *International Journal of Language Learning and Applied Linguistics World(IJLLALW), 4*(3), 313-322.

O'Malley, J. M., & Chaot, A. U. (1990). *Learning strategies in second language acquisition*. Cambrigde. Cambrige University Press.

Pan, Y. (2012). Attentional capture by working memory contents. *Can J Exp Psychol, 64*(2), 124-128.

Peters, E., Hulstijn, J., Sercu, L., & Lutjeharms, M. (2009). *Learning L2 german vocabulary through reading: The effect of three enhancement techniques compared.* Language Learning Research Club, University of Michigan.

Peters, E. (2007). Manipulating L2 learners' online dictionary use and its effect on L2 word retention. *Language Learning & Technology, 11,* 36-58.

Rott, S., Williams, J., & Cameron, R. (2002). The effect of multiple-choice L1 glosses and input-output cycles on lexical acquisition and retention. *Language Teaching Research, 6*(3), 183-222.

Schmidt, R. (1990). The role of consciousness in second language learning. *Applied Linguistics, 11*(2), 129-158.

Schmidt, R. (1993). Awareness and second language acquisition. *Annual Review of Applied Linguistics, 13,* 206-226.

Singleton, D. (2008). *Vocabulary learning strategies and foreign language acquisition*. Multilingual Matters, Cromwell Press Ltd.

Smilek, D., Dixon, M. J., Cudahy, C., & Merikle, P. M. (2002). Research report: Synesthetic color experiences influence memory. *Psychol Sci., 13*(6), 548-552.

Spence, I., Wong, P., Rusan, M., & Rastegar, R. (2006). *Research report: How color enhances visual memory for natural scenes*. University of Toronto, Toronto, Ontario, Canada.

Takeuchi, O. (2003). Language learning strategies and their relationship to achievement in English as a foreign language. *Language Laboratory, 30,* 17-34.

Vandergrift, L. (2002). It was nice to see that our predictions were right: Developing Metacognition in L2 Listening Comprehension. *The Canadian Modern Language Review, 58,* 555-575.

Watanabe, Y. (1997). Input, intake and retention: Effects of increased processing on incidental learning of foreign language vocabulary. *Studies in Second Language Acquisition, 19,* 287-307.

Vernon, D., & Lloyd-Jones, T. J. (2003). The role of colour in implicit and explicit memory performance. *Q J Exp Psychol A*., *56*(5), 779-802.

Wharton, G. (2000). Language learning strategy use of bilingual foreign language learners in Singapore. *Language Learning, 50*(2), 203-243.

Wichmann, F. A., Sharpe, L. T., & Gegenfurtner, K. R. (2002). The contributions of color to recognition memory for natural scenes. *J Exp Psychol Learn, 28*(3), 509-520.

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