

# The Impact of Semantic Clustering on Iranian EFL Advanced Learners' Vocabulary Retention

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## **Abstract**

This study investigated the impact of semantic clustering on Iranian EFL learners' vocabulary retention at advanced level. Participants were female learners randomly assigned to two groups of 15. Four instruments (TOEFL test; vocabulary pretest; immediate posttest, and delayed recall posttest) were used. The experimental group underwent semantic clustering vocabulary presentation in which the learners were provided with six lists each containing ten semantically related words in sentences, while, the control group was provided with the same words but the sentences were presented in a random way containing different topics, not semantic groups. The results revealed the outperformance of the control group in the delayed recall posttest.

**Keywords:** Semantic Clustering, Vocabulary Retention

## **1. Introduction**

Teaching vocabulary has always been a keystone in English Language Teaching, and finding an effective method for vocabulary learning has always preoccupied curriculum developers in general and language teachers in particular (Read, 2000; Richards & Renandya, 2002). One method which is currently employed in L2 vocabulary instruction is semantic clustering. Semantic Clustering is “a method of grouping words that share semantic and syntactic characteristics; often the term ‘lexical sets’ is also used” (Tinkham, 1997, p. 138). However, there is not an agreement among scholars on whether new vocabulary should be presented in semantically related or unrelated sets.

There are some researchers who speak in favor of presenting new words in semantic sets on the basis that it is an effective way of presenting new words, and possibly reflecting the natural organization of the mental lexicon (Aitchison, 1994, 1996). Haycraft (1993) asserts that it is easier to teach vocabulary items that belong to the same semantic field because learners will be able to form a pattern of interrelated words in their minds. There are numerous studies (e.g., Altarriba & Mathis, 1997; Grandy, 1992; Graves, 2006; Hashemi & Gowdasiaei, 2005; Heidari-Shahreza, 2015; Khosravani & Khorashadyzadeh, 2014; Seal, 1991; Stahl & Nagy, 2006; Stoller & Grabe, 1995; Wharton & Race, 1999) which have been conducted on the impact of the presentation of vocabulary in semantic clusters the results of which indicated that presenting words in semantic cluster helped the learners to become aware of the similarities in meaning and to determine and remember the differences between them.

There are other researchers (Finkbeiner & Nicol, 2003; Higa, 1963; Laufer, 1989; Nation, 2000; Tinkham, 1993, 1997; Waring, 1997), who point out to the Interference Theory and indicate that if similar words that share

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numerous common elements and a superordinate concept are introduced at the same time, these words will interfere with each other and have a negative impact on their retention due to cross-association and possible overloading in the short term memory. In addition, by the reference to the Distinctiveness Hypothesis, some scholars propose the ease with which distinctive (non-similar) information is learned (Eysenck, 1979, Tinkham, 1993). In this regard, some studies reflect the higher impact of introducing the vocabulary in the unrelated sets on the retention of these vocabulary (e.g., Erten & Tekin, 2008; Marashi & Azarmi, 2012; Mirjalili, Jabbari, & Rezai, 2012; Pigada & Schmitt, 2006)

Although a rich body of research has been conducted on the effects of semantically clustered vocabulary instruction on EFL or ESL learners and their performances, due to the controversy in the results, there is still room for researching in this area. Considering that few studies in Iranian context have focused on the semantic clusters (Khayef & Khoshnevis, 2012; Marashi & Azarmi, 2012; Mirjalili, et al., 2012), this study aimed to find which L2 vocabulary presentation type (i.e., semantically related sets or unrelated ones) is more helpful for advanced EFL learners' vocabulary retention in Iran.

## **2. Method**

### **2.1. Participants**

The participants in this quasi-experimental study included 30 EFL female learners all within the age range of 15-20 learning English at advanced level at a language institute in Tabriz, Iran. They were randomly assigned into the experimental and control groups each with 15 students.

## **2.2. Instruments**

Four instruments were used in the study.

- 1) TOEFL test: The reading and writing parts of a TOEFL test were given to the participants to confirm their homogeneity.
- 2) Vocabulary pretest: The pretest included 70 multiple-choice items of the new words to be taught. This test was used to find the unknown words. The validity of the test was checked by two experienced teachers in the area and its reliability was estimated through Cronbach's alpha and a high internal consistency of .82 was obtained.
- 3) Immediate recall posttest: Six immediate posttests were used during the treatment period. In other words, at the end of each session of teaching 10 new words, the teacher administered an immediate test. The average of these tests were used as the immediate recall posttest in the data analysis.
- 4) Delayed recall posttest: It was the same test administered as the pretest to the participants with 60 words in multiple-choice format. It was given to the participants after about one month of the treatment.

## **2.3. Procedure**

Before the treatment, the researcher-teacher asked the learners to take part on a verified TOEFL test to ascertain their homogeneity. Then, at the first session, we asked them to take the vocabulary test and considered the scores as their pretest performances. The vocabulary test included 70 words which were chosen to be taught during the treatment sessions. Ten of the questions were answered correctly; so they were excluded from the list and 60 remaining words were taught during the six sessions of the treatment period.

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In the experimental group, each session ten words were taught in semantically clustered sets embedded in sentences. The words were taught in Meaning, Pronunciation, and Form (MPF) style. It means the researcher-instructor first made the meaning of each word clear, then presented the correct pronunciation of the word and repeated several times and finally the written form of the word on the board and its grammatical category. Then, at the end of each session a multiple-choice test of vocabulary was given to the students. This process continued for six successive sessions. The scores of each test were recorded for further evaluation as the manifestation of short term memory.

On the other hand, the control group was taught the same words and sentences in the same style but in a random way. In other words, each of the experimental group's list had a different topic in each words were semantically clustered. However, for the control group, one or two sentences of all the topics formed a list of sentences which were not semantically related. They were supposed to learn them as the researcher-teacher presented them in MPF style. Like the experimental group, the control group received the same instructional activities and posttests at the end of each session.

Three weeks after the treatment, a delayed recall posttest was given to the both groups to find how much the teaching of vocabulary in the semantically related and unrelated sets could affect their vocabulary retention.

After collecting the data, they were entered into the SPSS 22 for further analysis. In order to compare the experimental and control groups' performances in the TOEFL, pretest, immediate posttest, and delayed posttests, four independent samples t-tests were conducted. The preliminary assumptions checking showed the normality and homogeneity of variances in

the scores of the groups. In addition, the homogeneity of the groups was confirmed at the beginning of the study.

### 3. Results

#### 3.1. Pretest Analysis

Having analyzed the preliminary data and ascertained the homogeneity of the experimental and control groups through an Independent-Samples t-test on the results of their TOEFL tests, the researcher-teacher compared the pretest scores through an Independent-samples t-test (Table 1).

**Table 1. Results of the Independent-samples t-test for the Pretest Scores of both Groups**

		N	Mean	Std. Deviation	Independent T test		
					t	df	P value
Pretest	EXPERIMENTAL	15	0.61	0.41	0.85	28	.84
	CONTROL	15	0.54	0.37			

\*  $p < .05$

As Table 1 indicates, there was no significant difference,  $t(28) = .85$ ,  $p = .84 > .05$ , between the mean scores of the experimental ( $M = 0.61$ ,  $SD = 0.41$ ) and control ( $M = 0.54$ ,  $SD = 0.37$ ) groups at the beginning of the study. As the mean scores show, the learners in both groups did not know almost any words in the pretest.

#### 3.2. Immediate Posttests Analysis

The results of the Independent-samples t-test for immediate posttest in both groups are shown in Table 2.

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**Table 2. Results of Independent-samples t-test for the scores of both Groups in the Immediate Posttests**

		N	Mean	Std. Deviation	Independent T test		
					t	df	P value
Immediate Posttests	EXPERIMENTAL	15	9.13	1.50	.46	28	.64
	CONTROL	15	8.86	1.64			

\*p<.05

Table 2 shows no significant mean difference,  $t(28) = .46$ ,  $p = .64 > .05$ , in the immediate posttest scores of the both groups, though the learners in the experimental group ( $M=9.13$ ,  $SD=1.50$ ) who were provided with the presentation of the words in semantic clusters performed slightly better than their peers in the control group ( $M=8.86$ ,  $SD=1.64$ ).

### 3.3. Delayed Recall Posttest Analysis

Table 3 shows the results of Independent-samples t-test related to the data obtained from the delayed posttest of the experimental and the control groups. Surprisingly, it was revealed that the mean score of the control group ( $M=51.58$ ,  $SD=4.62$ ) was significantly higher than that of the experimental group ( $M=49.54$ ,  $SD=5.38$ ),  $t(28) = 1.75$ ,  $p = .43 < .05$ . This means that teaching vocabulary through semantically unrelated sets was more effective than using related sets.

**Table 3. Results of Independent-samples t-test for the scores of both Groups in the Delayed Posttests**

		N	Mean	Std. Deviation	Independent T test		
					t	df	P value
Delayed	EXPERIMENTAL	15	49.54	5.38	1.75	28	0.43
Posttest	CONTROL	15	51.28	4.62			

\*p<.05

#### 4. Discussion

The results of the immediate recall posttests revealed that both groups had a very high performance on the tests administered right after the presentation of words either in semantically related or unrelated sets; however, the difference between their performances was not statistically significant. In contrast, a significant difference was found between the groups' mean scores in the delayed posttest with the better performance of the control group. This shows that the participants could remember the words better when taught in the semantically unrelated sets.

In this regard, the results of the study corresponds with the studies that indicate negative effects of cross-association of learning new words in semantic sets (e.g., Tinkham, 1997; Waring, 1997; Nation; 2000; Finkbeiner & Nicol, 2003; Marashi & Azarmi, 2012; Mirjalili et al., 2012).

The comparison of the results of the present study and the findings of other researchers in Iranian context revealed a contradictory results. The studies done by Khosravani and Khorashadyzadeh (2014) and Heidari-Shahreza's (2015) confirmed the positive impact of semantic clustering on vocabulary retention of the learners; while, in this study, the reverse was confirmed.



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The findings could be explained in terms of short-term and long-term memory concept. Cognitive psychologists divide memory into short-term and long-term memory according to duration of memory retention and capacity of recalling information after the original input (Schmitt, 2000). According to Schmitt, long-term memory retains information for use in anything but the immediate future. As Ericsson and Kintsch (1995) state, long-term memory is assumed to be very much larger and more durable than short-term memory. Moreover, long-term memory storage is associative, in that it relates items to one another. Also the time needed for storing a new memory trace in long-term memory is estimated to be longer. On the other hand, short-term memory is used to store or hold information while it is being processed. The object of vocabulary learning is to transfer the lexical information from the short-term memory to the more permanent long-term memory (Schmitt, 2000). As immediate posttests were administered right after the presentation of the words either in semantically related or unrelated sets at the end of each session and considering that the scores were indicative of the learners' short-term memory, it could not be surely concluded that the scores showed the actual learning of the words regardless of the way of presentation and the scores of the delayed recall posttest could give clearer results.

To justify the findings regarding delayed recall posttest, we need to review the concepts in cognitive psychology. According to Andrade and May (2004), memory consists of three stages of information processing: encoding, storage, and retrieval. In the first stage, encoding, information is rendered into a form that can be retained in memory. The second stage is storage, in which information is held in memory over a long period of time (Andrade & May, 2004). The third stage is the retrieval stage, in which information is accessed from storage and used to perform a specific task (Andrade & May, 2004).

Freeman, Romney, and Freeman (1987) proposed that two factors affect our recall of an event; how the person's schema is organized for that event and how typical the event is. In the case of the present study, it could be interpreted that the schemata had been organized well for all the participants which led to unobtrusive retrieval of words on their delayed recall posttests regardless of their treatment. A wealth of research emphasizes the importance of schemas in remembering events from memory, specifically called "Schematic Memory" (Stilwell & Markman, 2003).

## **5. Conclusion**

The study aimed to investigate the impact of semantic clustering on Iranian EFL learners' vocabulary retention at advanced level. Comparison of the results obtained from the immediate posttests revealed a nonsignificant difference between the experimental and control groups, while, a significant difference was found in their delayed posttests. The findings can be a verification for the Interference Theory and Distinctiveness Hypotheses, which do not support presenting semantically related vocabulary as a cluster.

The results of the study can be useful for the syllabus designers and textbook writers to consider the distinctiveness criterion in developing the materials regarding vocabulary recall at the advanced level.

This study was conducted among the female advanced level students, further research can be conducted among the male students at the advanced level to compare the results based on the gender. In addition, the study can be replicated and compared at different proficiency levels.

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