An Investigation of Semantic Cluster Helps Listening Comprehension of English Learners: A Case-study in Pass College

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Abstract. This paper introduces Daneman and Carpenter's test of working memory span, and taking the use of Chinese language materials collected by Chinese Language Education Research Center's bilingual corpus does a 3 week's experiment with both English majors and non-English majors in Pass College of CTBU (Chongqing Technology and Business University). The experimental group has 10 minutes vocabulary cluster training semantically and thematically before they start their English listening comprehension practice. Teachers introduce 1-2 vocabulary clusters, which includes two tasks (short-term memorizing within 10 words and predicting the sentences of options according to the vocabulary cluster).The overall results of new words acquisition reveals that semantic clusters are slightly better than thematic clusters. There is no statistically significant difference between presenting English words in semantic clusters or in thematic clusters in the acquisition or retention of new words. It indicates that the vocabulary teaching methods used most frequently by English teachers in the classroom were also the strategies most consistently uses in words learning by the subjects of this study and suggested that explicit teaching of vocabulary learning strategies could be helpful in semantic clusters.

Introduction

With the notion of globalization, English education becomes more and more recognized by Chinese people. Students are required by Ministry of Education to start learning English from junior high school in mainland of China, besides lots of kindergartens introduced the bilingual education (both Chinese and English) in big cities. Rooted deeply in an exam-driven tradition, English education in school was and is still very much focusing on grammar instruction and vocabulary memorization, which is always meant to deal with the exams at schools as well as the entrance exam for universities. With different perspective, English education in schools is stated in the curriculum guidelines that the focus of instruction should be towards communicative competence and the stress should primarily on listening and speaking skills. However, in order to bridge the ability gap of students between language competence and language performance, the four skills (listening, speaking, reading and writing) are seen as equally important. The most important and inevitable base of language acquisition is vocabulary building.

There are researchers[1] [2] [3] who are in favor of presenting words in semantically related clusters based on either a theoretical framework or the limited empirical support that is available. Vocabulary instruction was greatly influenced by the top-down, naturalistic and communicative approaches [4] and the emphasis was implicit teaching of words. The teacher presents an item of language in a clear context to get its meaning. This could be done in a variety of ways, such as through a text, a situation build, a dialogue etc.; then students are asked to complete a controlled practice stage where they may have to repeat target items through choral and individual drilling, fill gaps or match halves of sentences; finally, students are given a communication task such as a role play and are expected to produce target language and use any other language that has already been learnt and is suitable for completing it. To sum up, presenting words in semantically related clusters has found its way into materials and has been appreciated by learners, teachers as well as course

designers but presenting words in thematically related clusters has recently been noticed. Hence, the primary concern of the current study is to find out the familiar vocabulary acquisition and retention of semantic clustering versus thematic clustering in English listening comprehension practice.

Study

As Wikipedia mentions that research suggests a close link between the working memory capacities of a person and their ability to control the information from the environment that they can selectively enhance or ignore [5]. Such attention allows for example for the voluntarily shifting in regard to goals of a person's information processing to spatial locations or objects rather than ones that capture their attention due to their sensory saliency (such as an ambulance siren). The goal directing of attention is driven by "top-down" signals from the PFC that bias processing in posterior cortical areas [6] and saliency capture by "bottom-up" control from subcortical structures and the primary sensory cortices [7]. The ability to override sensory capture of attention differs greatly between individuals and this difference closely links to their working memory capacity. The greater a person's working memory capacity, the greater their ability to resist sensory capture. The limited ability to override attentional capture is likely to result in the unnecessary storage of information in working memory, suggesting not only that having a poor working memory affects attention but that it can also limit the capacity of working memory even further.

Data Collection

The main object selects three sophomore classes, each class has 20 students (17 girls and 3 boys), in Pass College of CTBU (Chongqing Business and Technology University) in mainland China. The study lasts 3 weeks. Class One is comparing group, which includes 20 English majors and accepts the ordinary listening comprehension practice. Class Two is experimental group I, which includes 20 English majors and adds in 10mins vocabulary cluster training before starting listening comprehension practice. Class Three is experimental group II, which includes 20 non-English majors and has same vocabulary cluster training. In the 10mins training, teacher will introduce 1-2 vocabulary clusters, which including two tasks (short-term memorizing within 10 words and predicting the sentences of options according to the vocabulary cluster).

Research Method

This study uses the method of experimental tests to obtain relevant research data. Firstly, this experiment use the cognitive psychology generic reading span test [8], to understand specific measurable levels of working memory capacity. Secondly, the study tests listening comprehension in two different post-process tasks to keep the effect of the original information. Thirdly, this study, due to the Wilcoxon Matched-Pairs Signed-Ranks Test, which is non-parametric alternative to the paired-samples t-test, compares the overall effects of learning words in semantic and thematic clusters on the post-tests. Spearman's Rank Order Correlation was used to find relationships between words learned and the use of vocabulary learning strategies as well as English listening comprehension background of the subjects, for semantic clusters and thematic clusters. The final conclusion based on effects of different processing tasks differences in vocabulary cluster memorizing ability, with campaigns to determine the impact of situation on memory capacity.

Data Statistics and Analysis

Different vocabulary clusters memorizing and results

Week 1: As every target word was known by the subjects from the pre-test, this indicated the subjects may show some different react to semantic clusters and thematic clusters.

Table 1.1: vocabulary cluster 1(Ready-known semantic clusters)

Body				
head	arm	finger	chest	hand
leg	foot	back		

Table 1.2: vocabulary cluster 2(Ready-known thematic clusters)

Direction				
right	left	east	west	south
north	front	back		

Week 2: Differing from Week 1, none of the target word was known by the subjects from the pre-test, this indicated sample homogeneity in terms of initial vocabulary knowledge. However, it was possible that some of them actually had some knowledge of some of the words but did not recognize them at the time of the pre-test.

Table 2.1: vocabulary cluster 1(Unknown semantic clusters)

Disaster				
tsunami	flood	drought	earthquake	typhoon
hurricane	volcano	capsize		

Table 2.2: vocabulary cluster 1(Unknown thematic clusters)

Computer				
cyber	log in	hacker	bug killer	computer virus
virtual community	distance learning	telecommute		

Table 3: Standard Deviations for Semantic and Thematic Clusters in Immediate Posttests

Test	Words Learned	Mean Difference	SD	Minimum	Maximum
Semantic 1	8	1.00	2.10	4.00	8.00
Thematic 1	8	1.00	2.10	4.00	8.00
Semantic 2	3	0.37	1.67	3.00	3.00
Thematic 2	2	0.25	1.92	2.00	2.00
Semantic total	11	0.68	1.56	2.00	6.00
Thematic total	10	0.62	1.86	1.00	6.00

Judging from the overall results of the immediate posttests of the two semantic clusters and the two thematic clusters from Table 3, semantic clusters seemed to result in slightly better acquisition of new words. An average of 8 words (50%) presented in semantic clusters were recalled by the subjects whereas 7 words (44%) presented in thematic clusters were recalled. To investigate the reaction of new words, the results of delayed posttests were analyzed. According to the overall results of the delayed posttests of the two semantic clusters and thematic clusters from Table 3, different from the results of immediate posttests, thematic clusters showed equal retention of new words.

It shows clearly that ready-known vocabulary makes no obvious difference, neither in semantic clusters nor in thematic clusters. Besides, semantic clusters play more effective influence than thematic clusters. In order to see if there was any relationship between the retention of new words in semantic clusters and thematic clusters, Spearman's Rank Order Correlation was used for extra information about words learning. Semantic clusters yielded exactly the same results as thematic clusters in retention of new words. In addition, the first semantic cluster was better than the first thematic cluster whereas the second thematic cluster was better than the second semantic cluster in retention of new words.

Different reaction of types of English learner

Week 3: According to Daneman and Carpenter [8] designed to test working memory span, and taking the use of Chinese language materials collected by Chinese Language Education Research Center's bilingual corpus , the subjects were tested memory span to measure the level of working memory .

Table 4: Overall Means and WM span test results

	M	SD	SE
Class 1	3.379	.290	.043
Class 2	3.854	.496	.138
Class 3	3.372	.405	.685
Total	3,535	.397	.289

Table 5: Post-listening identification effect of original word

	M+SD(post-listening)	t	df	Sig(2-tailed
Class 1	14.400+1.264	-2.200	34	.008
Class 2	15.846+.987	1.564	12	.139
Class 3	15.5143+.742	-1.843	32	.012

Table 6: Post-listening understanding of original passage

	M+SD(post-listening)	t	df	Sig(2-tailed
Class 1	5.371+.589	-4.660	34	.082
Class 2	6.320+.987	-1.902	10	.015
Class 3	5.471+.438	-3.935	32	.012

First, as the results of tests, working memory span results in different levels of the test object is $F_{(3,535)}$, p = 0.001 (<0.0001). The difference is significant, and indicated that working memory is changing with English learners' personnel types. There is a big difference between the levels, also. Secondly, depending on the value of working memory span (Table 4), the results determined the specific differences between people (Table 5&6).

Specifically, the class two, English majors received vocabulary cluster training, has the highest working memory capacity (M = 3.854), significantly higher than other people. On the other hand, non-English majors received vocabulary cluster training and English majors without vocabulary cluster training, their results are t = 3.372, p = 0.032 (<0.05); t = 3.379, p = 0.034 (<0.05), have reached significant levels. In addition, non-English majors received vocabulary cluster training has no obvious different working memory capacity with the group English majors without vocabulary cluster training, independent samples T-test results for the t= 1.697, p = 0.094 (p> 0.05) , indicating that the difference is very weak. Meanwhile, English majors received vocabulary cluster training has better memory capacity than non-English majors received vocabulary cluster training, independent samples T-test results for the t = 2.165, p = 0.033 (<0.05), reaching significant difference in levels. Overall, the data demonstrated a basic working memory span and showed increasing tendency to accept vocabulary cluster by English majors received vocabulary cluster training, as well as non-English majors received vocabulary cluster training. In other words, the more vocabulary cluster training took, the more abundant practical experience in English got. The impact on working memory capacity is more obvious and correspondingly stronger in English majors received vocabulary cluster training, which further confirms the conclusions of previous study that the difference between English majors received vocabulary cluster training and English majors without vocabulary cluster training is not only significant, p = 0.001 (<0.0001), but also the degree of English majors received vocabulary cluster training has shown to be large than other subjects.

Second, the results of this experiment in a splashy entry is: working memory span between non-English majors received vocabulary cluster training and English majors without vocabulary cluster training, has no significant difference, though the results is very close to the actual value, the difference is very small. This result does not seem consistent with the assumption that English majors play a better role in promoting working memory capacity than non-English majors received vocabulary cluster training. This result may be, for one part, selected subjects are limited. This experiment studies three sophomore classes, each class has 20 students (17 girls and 3 boys), in Pass College of CTBU (Chongqing Business and Technology University). They are two English major classes and one non-English major class. Due to the choice is limited, the representative data are bound to be some degree of influence; Secondly, in vocabulary cluster training, trainees have not received systematic vocabulary cluster training yet before, so the impact on the working memory capacity of vocabulary cluster in listening comprehension is also not obvious. Therefore, further empirical research in working memory capacity development study participants will continue to receive systematic vocabulary cluster training in order to further clarify the different campaigns promoting effect on working memory.

In this experiment, the study and results basically confirms the hypothesis, vocabulary cluster training help to improve the capacity of information storage and information processing in listening comprehension practice, i.e., with subjects to promote the development of working memory capacity, the longer the vocabulary cluster training takes and the richer experience with subjects, the working memory capacity stronger.

Summary

On the whole, both the identification effect of original word and understanding of original discourse after listening comprehension show a clear trend is that the higher the level of English mastering, the vocabulary cluster training effect is greater in English listening comprehension. Student performance in post-listening activities are significant different. The direct comparison between the semantically related words taken from textbook-based materials with the thematic words taken from storybook-based materials may be even more realistic and convincing. In the teaching and practice of English listening comprehension rational cognition (background information) and memory resources coordination is of crucial importance to understanding the whole original passage. But now, the limitation of research methods and measurement tools makes empirical research which carried out is not very sufficient. Still, the vocabulary cluster training is an

important research resources and useful method in working memory training in English listening comprehension. Further enquiry into the area of different vocabulary study strategy is definitely needed.

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