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The Effectiveness of Active Interaction in Interactive Visual Imagery as Created by the Keyword Method

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Introduction

A proven mnemonic method called the Keyword Method can be used to learn concrete word pairs, such as when learning a foreign language. In the Keyword Method, an English word that sounds or looks similar to the foreign word (the "keyword") is used to relate the foreign word and its English equivalent (Raugh & Atkinson, 1975). There are two steps to the keyword method. The first is to learn the foreign word, English translation and English keyword. The second step is to then create an interactive visual image using the English word and keyword (Raugh & Atkinson, 1975). This second step was the focus of this study. To date, there is little research on why interactive visual imagery is so effective for learning and memory. This experiment investigated this question by using the interactive visual images created by the keyword method to learn Indonesian-English word pairs. One possible reason tested in this experiment was the nature of the interaction described. An active interaction creates an active image where one subject is acting upon another, and a static interaction when no action is evident. This experiment presented participants with two sentences for each word pairing with one sentence describing a static relationship, and the other describing an active interaction. In addition, participants took part in a control condition where they were instructed to learn the foreign word pairings using rote rehearsal only. It was hypothesized that the static interaction group would recall significantly more word pairs than the control group, while those presented with the active interactions would learn and recall the highest number of word pairs overall.
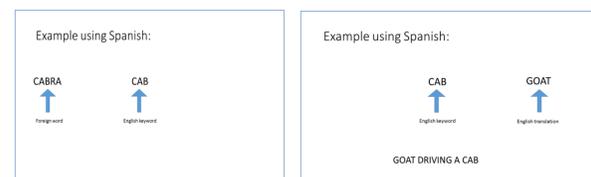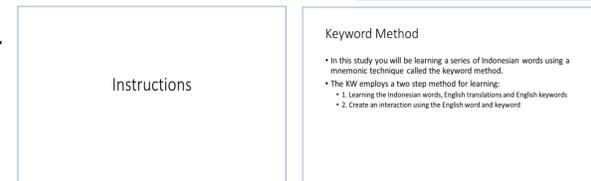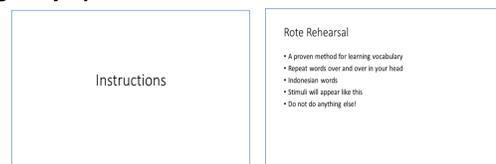
Methods

Participants:

150 total participants for this study, 50 per condition. Participants were college students from Psychology 101 classes at the University of Dayton and were ages 18-22.

Procedure (3 experimental groups):

Control: did not include any manipulation of the stimuli, used rote rehearsal to learn Indonesian words:

Experimental conditions: participants learned a list of 32 Indonesian-English word pairs using the previously described keyword mediators to relate the pair.

All conditions: Stimuli presented for six seconds before automatically moving on to the next

Example of Stimuli Used

Pedang-Pedal-Sword
Active: A sword slicing a pedal
Static: A pedal and a sword

Telur-Telephone-Egg
Active: A telephone smashing an egg
Static: An egg and a telephone

All conditions: tested using a cued recall task in which the participants had to provide the correct translation of the item on the test. The participants were told to recall the English translation of the word and write it down next to the corresponding Indonesian word. Ten minutes were given for this task.

Sample of Cued Recall Test

Indonesian	English	Indonesian	English
Mata		Taraf	
Paku		Tawon	
Pantai		Telur	
Pedang		Lembing	

Results

Using SPSS 23, results were analyzed and average scores found for each condition. As can be seen in Figure 1, the active condition yielded the highest number of words recalled on average (M=8.12, SD=5.14) and the static condition the next highest (M=5.22, SD=4.07).

As predicted, the control condition had the least number of words recalled on average (M=3.50, SD=1.94). A one-way Independent Samples ANOVA was performed on the means, $F(2, 147)$= 17.512, MSE=.356 to determine if the differences in the means were significant (p<.05) and this test revealed that there was an overall main effect of interaction type on words recalled. (p<.001). Given this result, further tests were performed. A Tukey's HSD test (Q_{crit}=3.31, SE=0.789) was run to determine which of the three conditions yielded significant results. It was found that the active condition (M=8.12) was significant when compared to both the static and control conditions (M=5.22, HSD=5.197, p=0.00097, and M=3.50, HSD=8.14, p=0.00094, respectively). However, the static condition (M=5.22) was not significant when compared to the control condition (M=3.50, HSD=3.08, p=0.078).

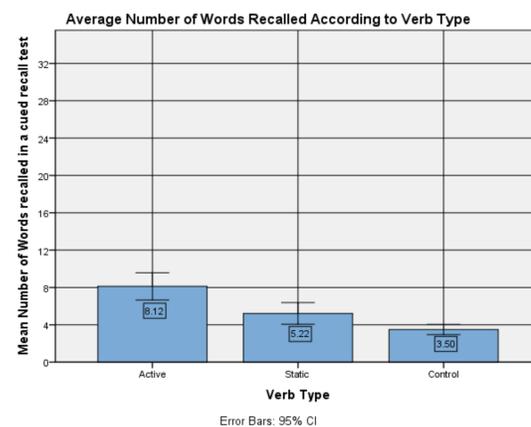Average Number of Words Recalled According to Verb Type

Figure 1 shows a means comparison between the three conditions, with the active interaction condition yielding the highest number of words recalled and the control condition yielding the lowest.

Conclusion

The results from this experiment show that the interactions that were described with active words do lead to higher recall scores on average than those that were described using static words. However, the differences between the average number of words recalled in the static condition and control condition were not significant. This is an interesting finding considering that the keyword method has been proven to be an effective technique for learning vocabulary and has been proven to be more effective than rote rehearsal. These results suggest that active interaction in mental imagery has an even greater importance than originally thought, with static interaction yielding such low word recall that it does not differ significantly from the control rote rehearsal group.

This study showed an effect of type of interaction (static versus active) on memorability of stimulus and because of this there could be many possible implications both in everyday life and in future research in this topic. Mnemonics are often used in education. Frequently utilized in schools for learning math, vocabulary, history, and foreign language as it was used in this study, mnemonic devices are shown to be very effective and conducive to learning. This study could potentially provide new strategies both for teaching and learning foreign language. Students can use the keyword method and more importantly use active verbs to create the visual image so that the image and subsequently the word pair is more memorable. As it is becoming more and more important to be multilingual in our constantly diversifying country, this research could help streamline the keyword method and make it even more useful for learning.

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