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THE LONG-TERM EFFECTS OF THE CONTEXT/KEYWORD AND ROTE METHODS ON THE RECEPTIVE AND PRODUCTIVE LEARNING OF EFL VOCABULARY*

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This paper reports on an experiment in which the long-term effects of the rote and the combined context/keyword methods on the receptive and productive learning of 15 English nouns by a group of college EFL learners were compared. Participants' receptive and productive recall were assessed either immediately after the treatment or a week later. The results showed that both methods were equally effective in enhancing recall of the Spanish word given its English equivalent (receptive recall), but that rote led to superior recall of English equivalents of Spanish words (productive recall). Lack of an optimal time to create and rehearse the images and students' maturity and experience as EFL learners are discussed as possible factors diminishing the effect of the context/keyword method.

In the recent past, some memory researchers (e.g., Pressley et al. 1987, Sadoski and Paivio 2001) have advanced theoretical rationales to argue about the enormous potential of combining context and the keyword method for the learning of foreign language (FL) vocabulary. Empirical research (Brown and Perry 1991, Rodríguez and Sadoski 2000), albeit sparse, has consistently provided strong empirical evidence supporting the predicted power of the combined method.

Brown and Perry (1991) compared the effects of context, keyword, and the combined context/keyword. They found that the combined context/keyword method

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produced better results than either context or the keyword method alone in all measures, although the only statistically significant difference was found between the two keyword conditions on a multiple-choice test given one day after the treatment.

More recently, Rodríguez and Sadoski (2000) extended Brown and Perry's findings by including the rote method into their research design. They found that the combined context/keyword method was superior to the keyword method in immediate recall and to keyword, context, and rote methods after one week, as evidenced by the impressive effect sizes obtained. Particularly interesting was the very low rate of forgetting exhibited by the combined context/keyword method relative to that of the other methods.

So far, the existing evidence indicates that the combined context/keyword method is more effective than other FL vocabulary methods. Its superiority has been observed with both high school and college students enrolled in regular classes of English as a foreign language (EFL) and in experiments in which retention interval was manipulated as either a within-participants or a between-participants factor.

However, all that the evidence to date amounts to is that the combined context/keyword method is effective in receptive learning, that is, recalling the translations of the foreign words. No evidence on its effectiveness in the other direction (i.e., productive learning) has been reported yet although a study by Moore and Surber (1992) yielded very promising findings. In that study, the context and the keyword methods were equally effective and superior to a no-strategy control in both immediate and delayed productive learning of German vocabulary.

The present study sought to extend the findings on the combined context/keyword method by examining whether its effectiveness holds for both receptive and productive learning of foreign language vocabulary. It involved college students who had been studying EFL for at least six years. Further, the present study contrasted the combined context/keyword method and the rote method. The rote method was included as control because it had compared favorably with the keyword method in several experiments assessing either receptive (e.g., Thomas and Wang 1996, Wang et al. 1992, Wang et al. 1993) or productive FL vocabulary learning (e.g., Ellis and Beaton 1993).

Method

Design and participants

In the present study a 2 (treatment: context/keyword, rote) x 2 (retention interval: immediate, delayed) between-participants design for both receptive and productive recall was used. One hundred and twenty-four first-year Spanish-speaking undergraduates from four EFL classes at a northern university in Venezuela completed the cued-recall tests. Two EFL instructors also participated in the study. Each instructor taught the experimental words in the two learning conditions and administered the cued-recall tests.

Materials

A modified version of Rodríguez and Sadoski's (2000) list of 15 English nouns was used in the present study. Two of their experimental words: *costard* and *hurdle* were replaced by their two practice words: *empennage* and *poteen*. Moreover, four new words: *lock, cart, pot*, and *tap* were included as practice words. The words were presented on transparency on an overhead projector. Different transparencies were prepared for each treatment condition. For the rote condition, each transparency included the list of English words and their Spanish definitions. For the context/keyword condition, each transparency included four English words, their keywords, and 12 sentences in which the English words were used (three sentences for each word). Furthermore, participants in this condition were given verbal descriptions of the researcher-developed interactive images. For example, for the English word *skillet* (sartén), the keyword *esqueleto* (skeleton) and the image of *a skeleton frying bones in a frying pan* (un esqueleto friendo huesos en un sartén) were provided. A total of 18 transparencies (6 for the training phase and 12 for the learning phase) was used (see Procedure below). Two cued-recall tests (one receptive and one productive) were administered to all the students. The receptive cued-recall test consisted of a list of 15 English words with blank spaces provided to write the Spanish definitions. The productive cued-recall test had an identical format with the list that included the 15 Spanish definitions and the blank spaces for students to write the corresponding English words.

Procedure

All phases of the experiment were conducted by the EFL instructors under the supervision of one of the researchers. Students in each class were randomly assigned to either a rote or a context/keyword learning condition and to either an immediate or delayed recall condition. The experiment took place in their classrooms during the regular class time. The instructors described the appropriate procedures for the method and used the four practice words to help students become familiar with it. To ensure comprehension, all the descriptions and instructions were given in Spanish.

The practice words were presented one at a time. The total presentation time was held constant across the learning conditions. Participants in the rote condition were paced through four randomized lists of the practice words at a rate of 15 seconds per word. They were instructed to repeat the English word and their Spanish definition several times in order to learn the pair. Participants in the context/keyword condition were paced through two randomized lists of words at a rate of 30–second intervals. First, they were directed to read the three sentences in which the English word appeared in capital letters and to infer its meaning. Once the meaning was determined, they were instructed to look at the keyword and to notice the orthographic and acoustic similarity of it with the English word. Then they were given the interactive image and asked to picture that image in their minds. Immediately after the practice session, all the participants took a recall test of the four practice items.

Then students were asked to learn the 15 experimental words using the same method they had used during the practice session. An incidental learning approach was used. Presentation of the experimental words was identical to that of the practice words. Following study and a 2-min filler task, participants in the immediate retention condition completed both the receptive and productive cued-recall tests (5 min each). To control for order effect, the tests were counterbalanced. Participants in the delayed condition were administered the cued-recall tests a week later and therefore were not administered the filler task.

Results

Both receptive and productive cued recall data were submitted to a 2 (treatment: repetition and context/keyword) x 2 (retention interval: immediate and a 1-week delay) between-participants ANOVA using the general linear model (GLM) procedure. The experiment-wise alpha level was set at .05. The means, standard deviations, and group ns are presented in Table 1.

Table 1. Means, Standard Deviations, and Group ns
for Receptive and Productive Cued Recall

	Receptive Recall						Productive Recall					
	Immediate			Delayed			Immediate			Delayed		
Treatment	M	SD	n	M	SD	n	M	SD	n	M	SD	n
Rote	11.17	3.41	36	8.55	3.87	31	6.29	3.71	36	5.14	4.04	31
Context/keyword	10.42	3.80	33	7.50	4.10	24	4.29	4.06	33	3.73	3.87	24
Maximum score = 15												

Receptive Cued Recall

A statistically significant main effect was found for retention interval, $F(1, 120) = 16.35$, $p < .0001$. No statistically significant effects were found for either treatment, $F(1, 120) = 1.26$, $p > .26$ or the interaction between treatment and retention interval, $F(1, 120) = .05$, $p > .82$. The test of homogeneity of variance proved statistically non-significant, $F(3, 120) = .43$, $p > .72$.

Productive Cued Recall

A statistically significant main effect was found for treatment, $F(1, 120) = 5.84$, $p < .02$, indicating that students in the rote condition were superior to those in the context/keyword condition. No statistically significant effects were found for either retention interval, $F(1, 120) = 1.56$, $p > .21$ or the treatment by retention interval interaction, $F(1, 120) = .17$, $p > .68$. The test for the homogeneity of variance proved statistically non-significant, $F(3, 120) = .23$, $p > .87$.

Although overall performance of the rote students was statistically superior to that of the context/keyword students, further analyses for immediate and delayed cued recall yielded a statistically significant difference between the groups for immediate recall, $t(67) = 2.14$, $p < .05$, but not for delayed recall, $t(53) = 1.31$, $p > .14$. Effect sizes of .52 and .36 standard deviation units were obtained respectively for immediate and delayed recall. These effect sizes are medium (Cohen 1988).

Discussion

The present study compared the long-term effect of the combined context/keyword method with that of rote on receptive and productive learning of English vocabulary under classroom conditions by EFL college students. Results on receptive recall indicated that the performance of the students in the combined context/keyword condition was comparable with that of those in the rote condition (69.47% vs. 74.47% for immediate recall and 50% vs. 57% for delayed recall, respectively). As can be seen, both methods proved very effective in helping students to remember Spanish definitions quite well over time.

These results are consistent with those of previous studies by Brown and Perry (1991) and Rodríguez and Sadoski (2000) in that they showed that the combined context/keyword enhanced students' recall of definitions. Particularly interesting is the comparison with those of Rodríguez and Sadoski (2000). These researchers found that students using the combined context/keyword were able to recall about 75% of the definitions immediately and about 68% after 1 week. Additionally, they found that in delayed recall, the combined context/keyword method was, on average, 1.5 times better than the rote method.

In the present study, however, the fact that the context/keyword method was comparable to the rote method on delayed recall is at odds with Rodríguez and Sadoski's findings. Comparison of the forgetting rates in the two experiments clarifies the discrepant result. In the present study, the forgetting rate of the rote method was comparable to that of the context/keyword method (17.47% vs. 19.47%, respectively), while in Rodríguez and Sadoski, it was almost three times greater (22.2% vs. 8.2%). Hence, in the present study the forgetting rate of the rote method decreased by almost one-fourth, while that of the context/keyword increased by more than 100%.

Nonetheless, it is interesting to point out that the present study bears important methodological differences with that of Rodríguez and Sadoski (2000). First and foremost, in the present study, presentation of each experimental word in the context/keyword condition lasted 60 seconds (2 passes at 30-s intervals) as opposed to about 120 seconds in Rodríguez and Sadoski (2000). Given the lengthy procedure associated with this learning condition (i.e., reading of the three sentences, inference of the word's meaning, presentation of the keyword and of the oral image), there follows that students in the present study had very little time to create and rehearse the images. Since creation and rehearsal of the images have been claimed to be responsible for sustaining performance of keyword learners (Atkinson 1975), then lack of an optimal time to do it may account at least in part for the steeper forgetting

rate exhibited by the context/keyword method. However, what an optimal time for the context/keyword method might be is of course an empirical matter.

Second, the participants in the present study were considerably more mature and experienced EFL learners. They were college students who had studied EFL for at least six years as opposed to the ninth graders in Rodríguez and Sadoski who had studied EFL for a little more than two years. Previous research (i.e., Cohen and Aphek 1981, Kasper and Glass 1988) has shown that experienced learners have developed successful methods and strategies, including some mnemonic-based, for learning foreign vocabulary. Thus, it is likely that students in the rote condition may have spontaneously used some mnemonic-based strategy for learning the English vocabulary. Conversely, some students in the context/keyword condition may have not faithfully followed the procedures associated with the context/keyword method and may have resorted instead to other strategies, which had proven successful in the past. However, because no self-report data were collected in the present study, this remains an open question.

Results on productive recall indicated that students in the rote condition were able to recall considerably more experimental words given their Spanish definitions than those in the context/keyword condition (41.93% vs. 28.60% and 34.29% vs. 24.87% for immediate and delayed recall, respectively). Additionally, they indicated that students in either treatment condition found productive recall more troublesome than receptive recall, a finding consistent with those of previous research (e.g., Ellis and Beaton 1993, de Groot and Keijzer 2000, Gruneberg and Pascoe 1996, Hall et al. 1981, Moore and Surber 1992, Pressley et al. 1980). Several explanations for the superior performance with receptive testing have been advanced, including availability of native language (NL) and FL words, inherent differences between comprehension and production tasks, and the activation patterns produced by the NL word and the newly learned FL word (for a discussion of these accounts, see de Groot and Keijzer 2000).

Because the present study was the first attempt to assess the effectiveness of the context/keyword method on productive learning of foreign vocabulary, comparison of its effect with that of previous research is not possible. However, the finding about the effectiveness of the rote method was consistent with that of Ellis and Beaton (1993).

In sum, the results of the present study indicated that the rote and the context/keyword methods were equally effective in enhancing receptive recall, but that rote was superior to context/keyword in facilitating productive recall. However, whether students' maturity and experience as EFL learners and the lack of an optimal time to create and rehearse their images worked independently or in combination to diminish the long-term effect of the context/keyword method on receptive and productive learning of foreign vocabulary warrants further research.

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