

Effect of Key-Word Method on Memory of Word Groups
for Chinese Learners of English

Guey, Ching-chung
I-Shou University

Cheng, Yin-yao
National Sun Yet-Sen University, Taiwan

Huang, Li-jung

Abstract

The study intended to explore the effect of a new keyword method on learning English vocabulary for Chinese learners. Previous research on L2 vocabulary learned by keyword method has primarily involved the use of English keywords to learn the vocabulary of other languages on one single word basis. The present study employed English keyword to learn a group of new English words. One hundred and twenty students of Junior College graduates with roughly eight years of learning English as a foreign language (20-21 years old on average) learned the definitions of 18 new English words (arranged in groups) either by keyword method or by direct translation and memory. An English-Chinese paired association task was administered either immediate or 1-week later in a between-subject experimental design. Results show that both keyword method groups made superior performance on recall, and the interaction between methods and duration on recall was also significant. Results indicated that this new keyword method may be adopted as one of the means for Chinese students to learn English vocabulary.

Keyword: keyword method, Chinese learners, English vocabulary, paired association task.

Purposes:

English vocabulary has played an important role for Chinese learners to master English as a second or foreign language. Many students are frustrated in listening, speaking, reading, and writing of English out of insufficiency of English vocabulary. And English teachers had difficulties helping students comprehend grammar rules and apply them mainly because their students assumed limited command of vocabulary. It was found that the amount of vocabulary was closely related to the effect of instruction in the classroom (Krashen & Terrell, 1983). How to help students acquire the optimal amount of vocabulary with the least amount of time and effort has long

become the challenging task for most native and ChineseEnglish teachers (Levin, Levin, Glasman, & Nordwall, 1992;_McKeown & Beck, 1988; Meara, 1992, 1996a, 1996c).

Most recognized approaches for vocabulary acquisition are focused on learners' guessing through contextual cues (Scherfer, 1993; Schmitt & Schmitt, 1995; Service, 1992; Nation, 1990; O'Malley & Chamot, 1990). And some English teachers in Taiwan encourage students to increase their vocabulary through extensive reading, or even suggest rote memory of words in the dictionary as a means. All these approaches may fit certain number of students, but when dealing a large number of words or the timeliness of learning them, the effective principles suggested by learning psychology can be useful. Robert Gagne (1978) has pointed out the fact that successful learning relies heavily on cognitive association between what has been learned and what has yet to be learned, rather than on rote memory. In 1970s, an approach based on pictorial memory, keyword method, was developed to expand vocabulary (Atkinson, 1975). This keyword method involved two phases: first, associate the keyword(learned parts of a target word) with the target word, and then create a mental picture in which the keyword and the target word are associated. For instance, in the target word 'carta' (a Spanish word, meaning 'letter'), learners are asked to associate the first four letters of 'carta' with English word 'cart,' (as the key word), and then create a mental picture: a letter is in the cart, or a letter is chasing the cart . In this way the Spanish word "carta" is associated with English word "letter, which may facilitate its next recall as long as the keyword "cart" is spotted.

This keyword method, has, in reality, been applied for centuries (Thompson, 1987). And many latest studies have also proved its effectiveness (Pressley, Levin, & Delaney, 1982; Atkinson & Raugh, 1975), though this keyword method is anything but a panacea since there are many other factors(e.g. different thinking styles), as indicated by Rose (1985), involved in the whole process of recall. There were studies which investigated the instant and delayed memory effect of keyword method for learners of different age groups and found that the most optimal effect can be expected from learners of 6-8 years old when pictures are provided. (Pressley & Levin 1978). It seems that elaborated skills of associations based on mental picture are gradually developed as learners grow (Rohwer, 1973).

Yet inconsistencies in the results of studies on instant and delayed memory effect of keyword method were also found. Some studies found the effect of keyword method on both instant and delayed memory situations (Merry, 1980), while other studies

found the effect only on instant memory tasks, or even less effective than rote memory approach did in the long term memory (Wang, Thomas, & Ouelette, 1992). To settle the inconsistencies, we need to explore more about the associative processes involved in the keyword method.

As dual-coding theory indicates, the mental pictures created by keyword method can be used as media for recall (Paivio, 1986). Many researchers argue that keyword method provides learners with connections of definitions between target words and key words, which facilitates the recall of target words; that is, learners can have an access to the definitions of the target word through the clues of the keyword in the target word (Pressley, Levin, Kuiper, Bryant, Michener, 1982). In the case of Spanish word 'carta', learners (English native) may spot the Spanish word (eg. carta) first, and then retrieve from their memory the most similar words in English (eg. cart). Next, a mental image of the connection between 'cart' and 'carta' is created. From another angle, the keyword here can be regarded as a cue marker, which may serve as a medium between itself and the target word (Meyer et al., 1980).

But for two different languages(L1 and L2), there are shared and separate language stores in bilinguals, with both stores interdependent on the phonological and morphological levels(Cristoffanini et al., 1986). In the case of 'carta', obviously, the associations between 'cart' and 'carta' may involve both similar phonemes and similar morphemes, and we are not sure whether it is the phonemic associations or morphemic associations or both that actually facilitate instant and delayed memory recall of the target word.

Seeing that similarity in both phonemes and morphemes may not be found in a given target word and keyword (especially for Chinese learners of English), we do not know exactly what causes the effect. And this is probably one of the causes of inconsistencies among related studies. It is likely that learners with rote memory approach may not experience, thus not confused by, the inconsistencies of phonemes and morphemes clues from the target word, while learners with keyword method may suffer, thus confused by, the keywords with less similarity. So, it is plausible to design an experimental study in which the confusions from similar morphemes or similar phonemes can be partial out, to see if the effect of keyword method can be specified and consolidated. In addition, as Morgan, Meier, and Newport (1987) pointed out that learning can be most successful if language input consists of grouped and structured input, we can conduct such an experiment in which keywords can be arranged on either the phonological or the morphological level, with target words on group basis.

Thus, in the present study, target words are presented in groups with similar morphemes in suffix, and different morphemes in prefix (as keywords), which is quite different the conventional keyword method, which deals with one word at a time. That is, we will test the effect of morphemes in the present study, leaving phonemes to future study). To be more specific, this study covers a group of three words as a unit, and a total of 6 groups (18 words) are used as learning material. For example, in the group of words: gash, lash, and clash, they all have 'ash' in the suffix, leaving 'g', 'l', and 'cl' different. And the different part of the words are treated as target words with an exemplified sentence for each:

1. gash → The gas hurt his gash on the face.
2. lash → Lasting lash made her seriously wounded.
3. clash → The class made the clash.

For the word 'gash', the first letters 'g.a.s' (gas), is the keyword, and a mental image between the 'gas' and 'gash' can be created and indicated by the exemplified sentence(The gas hurt his gash on the face). Also, the first three letters 'l.a.s.' of the word 'lash' is similar to 'last', and a mental image between 'last' and 'lash' can be created and indicated through its exemplified sentence(Lasting lash made her seriously wounded). So is in the word 'clash,' a mental image between the keyword 'class' and target word 'clash' can be created and indicated by its exemplified sentence (The class made the clash). Such an arrangement with 'target word' in the context of a sentence can help students more fully understand the meaning as well as the usage of the target word, and avoid possible criticisms concerning the focus on meanings rather than on the usage of the target words in the previous studies on keyword method. (Pressley, Levin, & Miller, 1981).

The group of words with identical morphemes as target words can be more effectively processed than target words without groups in that the former arrangement may offer mutual reference among each similar word in groups in its future recall. And confusions from words with similar morphemes can be avoided. That is, the different parts of the morphemes as keywords are dealt with in each association task. Such an arrangement of target words is quite different from those often appear in ordinary vocabulary books in which the different parts of each word in groups were not treated through keyword association.

In specific, the three target words, as mentioned above, can be regarded as: 1) (gas + las + clas) h, or 2) (g + l + cl) ash, but the (gas + las + clas), or (g + l + cl) were

not processed with association. Further, treating one word at a time (i.e., the three words appear in different places) means conducting keyword association of three words separately and independently, which is anything but economical. And this is the point for exploration in the present study.

The questions to be explored in this study include:

1. Which approach is superior, keyword method or conventional rote memory, in learning groups of words on an instant recall task?
2. Which approach is superior, keyword method or conventional rote memory, in learning groups of words on a delayed recall task?
3. Is there an interactive effect between these two approaches on instant and delayed recall tasks?

Method:

Design:

The present study adopted Between-subjects Design in which four groups of subjects were arranged as: (each with 25-minute exemplified sentences learning format)

- a. keyword method instant recall
- b. conventional rote memory method instant recall
- c. keyword method delayed recall
- d. conventional rote memory method delayed recall

Subjects

A total of 120 students (66 males, 54 females) were randomly selected from 268 nonnative English learners of English (20-21 years of age with roughly 7 years of experience in learning English) in a supplementary school for Junior college entrance exams. These 120 subjects were randomly assigned to four groups, with each 30 subjects (Keyword instant recall group, 17 males, 13 females; Conventional instant recall group, 19 males, 11 females; Keyword delayed recall group, 16 males, 14 females; and Conventional delayed recall group, 14 males, 16 females). All the subjects received vocabulary pretest (60 words in 20 groups), and then 18 words in six groups were filtered out as target word groups for investigation (these 18 words were totally unknown to all the subjects)

Instrument:

There were two versions of exemplified sentences for each of these 18 new words in six groups (with 3 words in each group): Keyword association and conventional versions. Both versions were attached with Chinese translation of each sentence to avoid the effect of different wordings. Also, an 18 English-Chinese paired blank filling test was administered. Finally, the results of the test were analyzed through ANOVA statistical method.

Procedures::

The experiment was conducted by an experienced English Teacher, and Subjects in four different groups received the assigned version of learning material (2 groups for keyword method version, and the other 2 groups for conventional method version). For keyword method groups, the rationale of association through keywords in the exemplified sentences was introduced, while for the conventional groups (as control groups) the teacher read and explained the meanings of exemplified sentences. This lecturing session took about 20 minutes for all the groups, and then all the subjects in the four groups were asked to return the learning materials. Next, subjects of the two instant recall groups were asked to stay and take the English-Chinese Blank filling test in a 15-minute period of time, and the other delayed recall groups were told to show up a week later. Since all the randomly sampled subjects were not informed of the purpose of the experiment, and the learning materials were not handy, the unexpected practice effect and possible contact among students with regard to test items can be excluded .

Results and Discussion:

In the present study, different versions of learning materials and different time recall are independent variables, with students' performance on English-Chinese Blank filling test as a dependent variable. The results were analyzed through 2 x 2 ANOVA technique to explore the effect of different approaches on different time recall. Table 1 indicates Means and Standard deviations in English-Chinese Paired Recall task.

Table 1. Means and Standard deviations in English-Chinese Paired Recall task

	Methods					
	Keyword			Rote memory		
	M	SD	N	M	SD	N
Time of recall						
Instant	10.1	3.80	30	4.3	3.32	30
Delayed	3.3	2.20	30	1.6	2.54	30

P.s.: Full Score =18

Table 2. 2 (Keyword/Rote memory) X 2 (instant/ delayed recall) ANOVA

		<u>SS</u>	<u>df</u>	<u>V</u>
Time (instant/a week)	R	672.1	1	672.1
Approach(keyword/conv.)	C	410.7	1	410.7
Time X Approach	RXC	128.16	1	128.16
Within	w	1062.34	116	9.15
Total		2273.3	119	
Fr= 73.38 ***,		Fc= 44.84 ***,		Frc= 13.99 **
p<.001				

The results indicated that there was a significant effect of keyword method; i.e., keyword method was superior to conventional approach ($F = 44.84, p < .0001$). And the effect of Time delay was also significant ($F = 77.38, p < .0001$). That is, the result of Instant Recall is better than that of Delayed Recall. Further, an interaction effect between Approach and Time was also significant ($F_{1,116} = 13.99, p < .0001$. (See chart 1)

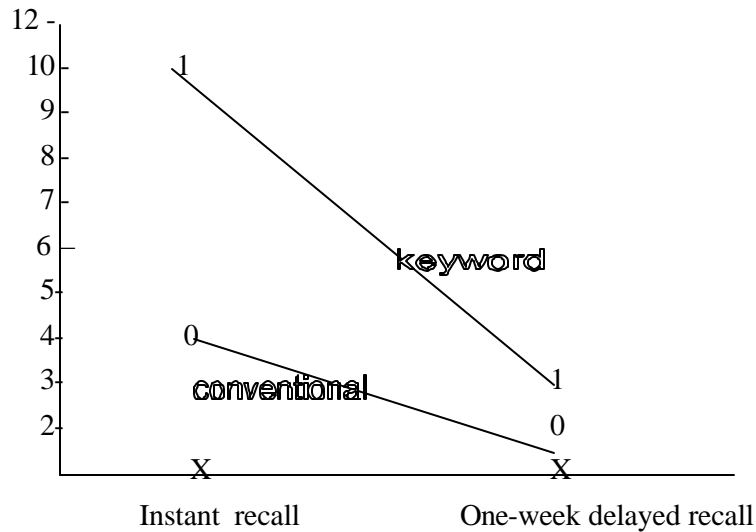


Chart 1: Interaction between methods and time of recall(1-keyword/
0-conventional)

From Chart 1, subjects with keyword method performed better all the way than those with conventional approach, and a sharp decline can be observed in both approaches, yet keyword method still superior. For the interaction between approaches and Time delay, the difference between two different Time delay groups with keyword method is larger than that with conventional approach.

Most previous keyword method studies used keywords in English or foreign language (e.g. Spanish) to learn another language, and only one word was dealt with at a time, as in Atkinson's study (1975). In the present study, we used the keywords in English on word group basis, to firstly explore the effect of keyword method, as compared with the conventional approach. The keyword method was found to be generally more effective than conventional approach by 2.27 times ($6.7/2.95=2.27$). Second, we also explored the effect of keyword method, as compared with the conventional approach on Time delay. The results showed that keyword method was more effective than conventional approach on Time delay by 2.06 times ($3.3/1.6=2.06$). Next, we also investigated whether the memory loss caused by different Time delay would be different between keyword and conventional methods. As is shown, there was more memory loss in keyword method than in conventional approach (with the former 69.4% memory loss, and the latter 52%). But, Such a decline does not mean, as Thomas, and Ouelette argued (1992), that keyword method causes more memory loss than conventional method does in terms of long term memory, for the former was still superior to the latter regardless of Time Delay. To further consolidate the nature

of interaction effect, the interested researchers in the future may conduct another experiment in which longer than one-week time delay can be included in the design (3-week delay or four-week delay), or offer subjects more practice on learning material before posttest is administered. If the results under such an arrangement remain the same (i.e., performance in keyword method keeps going down), then what Wang, Thomas, and Ouelette argued (1992) may be supported. Yet it is important to note that the effect of target method, as indicated in the present study, can only be specified on its morphological level. As to the effect of such a method on phonological level as well as the relative effects between these two levels shall be tested in another study in order to further consolidate what exactly is behind the keyword method.

Summary:

From the present study, the overall performance in groups with keyword method was superior to that with conventional approach, which indicated that the former method can be suggested for nonnative English learners (Chinese). Yet, the keywords in the present study were mainly English words, so only students with certain amount of English vocabulary may benefit from this method. Seeing that the target words in the present study were treated in groups (only partially similar to the target words in spelling), such a design was subtle in that it seems more economical in terms of cognitive load (words with similar spelling can be a pro for short term memory). Interested researchers may also conduct studies in which target words arranged in groups are compared with those on one-to-one basis to explore the possible grouping effect. Such a grouped keyword method can be used for Chinese high school students to expand their vocabulary systematically through keyword association processes. Further, the exemplified sentences for target words can also serve as a tool for students to mobilize their creativity in the course of doing associations based on keywords. Yet the blank filling task used in the study can be further elaborated or replaced by cloze procedure in the future research, which may offer students contextual cues in the course of vocabulary building. Still there are some problems yet to be solved in the present study. For one thing, how do beginners apply this keyword method since they may not have enough English words as keywords for association? Interested researchers in the future may conduct the kind of experiments, which explore the effects of different association processes (phonemic association vs. morphemic association) since there is only phonemic connections between English and Chinese for beginners of English.

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Appendix 1: Materials used in the study (conventional format)

?????: ??? 30 ???, ?????????, ?????, ???,

????????????, ?????????.

gash n ??? v ??

?? : There is a **gash** on his leg. (????? **???**)

lash n ??, ?? v ??

?? : It is not right to **lash** kids. (?????????)

clash v (?) ...???? n ???

?? : I heard a **clash** next door. (?????? **???**)

bail n ?? v ??

?? : She **bailed** his son out yesterday. (?????? **??**??)

hail n ?? v ??

?? : I saw the **hail** falling outside. (???????? **??**)

kail n ?????, ??

?? : She bought a lot of **kails** today. (???????? **????**)

exult v ???;??

?? : After the game, everyone **exulted**. (????, ????? **??**)

occult a ???

?? : She is interested in **occult** experience. (?? **???**?????)

tumult v. ? ?

? ? : I cannot stand the **tumult** outside. (? ? ? ? ? ? ? ? ? ?)

chariot n. ? ?

? ? : The battle field is full of **chariot**. (? ? ? ? ? ? ? ?)

zealot n. ? ? ?

? ? : He is a **zealot** in politics. (? ? ? ? ? ? ? ?)

helot n. ? ?

? ? : There used to be a lot of **helots** in America. (? ? ? ? ? ? ? ?)

loll v. ? ?

? ? : The dog's tongue **lolloed** out. (? ? ? ? ? ? ? ?)

knoll n. ? ? , ?

? ? : I saw a small **knoll** on the beach. (? ? ? ? ? ? ? ? ? ?)

scroll n. ? ? , ? ? ?

? ? : She showed me a **scroll** of painting . (? ? ? ? ? ? ? ?)

thrift n. ? ?

? ? : Chinese are noted for life of **thrift**. (? ? ? ? ? ? ? ?)

rift n. ? ?

? ? : There is a **rift** between the boards. (? ? ? ? ? ? ? ?)

drift v. ? ?

? ? : I enjoy watching drifting clouds. (? ? ? ? ? ?)

Appendix 2: Materials used in the study (keyword method format)

???? : ??? 30 ??? , ????????? , ????? , ??? ,
???????????? , ????????

gash n ??? v ??

?? : The **gas** hurt his **gash** on the face. (? ? ? ? ? ? ? ?)

lash n ?? , ?? v ??

?? : **Lasting** **lash** made her seriously wounded. (? ? ? ? ? ?)

clash v (?) ...???? n ???

?? : The **class** made the **clash**. (? ? ? ? ?)

bail n ?? v ??

?? : As a **bait**, he was **bailed** out. (? ? ? , ? ? ? ?)

hail n ?? v ??

?? : On his **hat** fell the **hail**. (? ? ? ? ? ?)

kail n ????? , ??

?? : I saw a **'K'** on the **kail**. (? ? ? ? ? **K** ? ? ? ? ?)

exult v. ?? ; ??

?? : He made his **ex**-wife **exult**. (? ? ? ? ? ? ?)

occult a. ???

?? : He was **occupied** with **occult** experiences. (? ? ? ? ? ? ? ?)

tumult n.. ??

?? : People near the **tomb** caused **tumult**. (? ? ? ? ? ? ? ?)

chariot n. ??

?? : There is a big **chart** on the **chariot**. (? ? ? ? ? ? ? ?)

zealot n. ???

?? : He is a **zebra** **zealot**. (? ? ? ? ? ? ? ?)

helot n. ??

?? : The man who lives like **hell** is a **helot**. (? ? ? ? ? ? ? ?)

loll v. ??

?? : He **lowered** and **lolloped** his hands. (? ? ? ? ? ? ? ?)

knoll n. ?? , ?

?? : Everyone here **knows** the **knoll** on the road.

(? ? ? ? ? ? ? ? ? ? ? ?)

scroll n. ?? , ???

?? : There is a **screw** on the **scroll**. (? ? ? ? ? ? ? ?)

thrift n. ??

?? : I know **three** men that lived in **thrift**. (? ? ? ? ? ? ? ?)

rift n. ??

?? : Near the bank of **river** a **rift** can be seen. (? ? ? ? ? ? ? ?)

drift v. ???

?? : In the rift, there is a drift. (??? ? ? ? ???)