

# A Study on English Vocabulary Learning and Memory Strategies Used by Chinese English Learners

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## ABSTRACT

Vocabulary is the cornerstone of language learning. The factors affecting the efficiency of vocabulary learning present a diversity. In this study, a five-point Likert scale questionnaire containing 20 closed-ended items was used to investigate attitudes, difficulties, methods and strategies. The data obtained from the questionnaire were analyzed quantitatively using SPSS. The results of this study showed that: high school students' experience and difficulties in word learning have a stronger influence on their understanding of word learning. Therefore, high school students should pay attention to accumulating experience and seeking help to overcome difficulties in word learning.

**Keywords:** *high school students, vocabulary strategies, Likert scales*

## 1. INTRODUCTION

As we all know, words are the foundation of language. Without the accumulation of a large number of words, it would be hard to have input or provide output. Therefore, the author designed a questionnaire to Chinese high school students of different grades to try to understand respondents' word memory strategies.

With the help of SPSS questionnaire on the four dimensions of thinking about the experience of learning words, the way of word memory, the attitude of learning words, the difficulty of learning words, descriptive analysis, validity analysis, reliability analysis, regression analysis and correlation analysis are carried out. Overall Cronbach's  $\alpha$  Coefficients and dimensions Cronbach's  $\alpha$  Coefficients will be given special attention as key analysis contents.

The questionnaire contains the respondents' age, grade, and other basic information, as well as the Likert scale test results of the respondents' thinking about the experience of learning words, the way of word memory, the attitude toward learning words and the difficulty of learning words.

## 2. METHOD

### 2.1 Participants

This study invited Chinese high school students to fill in a questionnaire. High school students have been

learning English for many years and have rich English learning experiences. This study finally collected 30 questionnaires, which is about equivalent to the capacity of a class under the background of Chinese education. 30 questionnaires provide some support for data analysis, and the number is still within the scope of the author's control, which also improves the operability of the research to a certain extent.

### 2.2 Instrument

This study takes the cognition of word memory strategies as the theme and designs the Likert scale questionnaire. The questionnaire launches questions in four dimensions around the theme, with five questions under each dimension. The content closely fits the word memory strategy and is highly consistent with the actual situation of the interviewee.

### 2.3 Procedures

- 1) Selected research areas and research objects.
- 2) Design the whole questionnaire. (Identify several multi-item scale variables and Select also some relevant background variables) .
- 3) Distribute the questionnaires and collect the results.
- 4) Enter the data in an SPSS data file.
- 5) Identify questions in the questionnaire that do not belong to the Likert scale.
- 6) Descriptive analysis

- 7) Reliability
- 8) Validity analysis and factor analysis
- 9) Regression analysis

**Difficulties encountered:** In the reliability analysis, it is found that two reliability values under the dimension of word learning style are very low, which can not be included in the analysis and consideration. Since the dimension of learning style is an important part of this study, the key words and questioning methods of the two items that do not meet the requirements in the dimension of learning style are modified, which can improve the reliability of the items. The reliability of the modified items is analyzed again, and it is found that one of them is still not within the allowable range of reliability. Therefore, the measure of deleting this item is taken to test the ability.

**3. DATA ANALYSIS**

Before the reliability analysis, the Likert scale is used as the judgment standard to screen the problems and exclude the non degree problems that can not be included in the reliability analysis, which is the basis of the following analysis.

By summarizing the results, it can be found that the overall reliability of the questionnaire is persuasive enough after excluding non degree problems, and the topic setting can reflect the research topic. Among them, the reliability of word learning experience and word learning difficulties is high, and the reliability of learning style and learning attitude is low. In general, the design of the whole questionnaire meets the requirements of statistical reliability and can be considered a questionnaire with qualified reliability.

**4. RESULTS AND DISCUSSION**

This research on senior high school students' word memory strategies mainly uses SPSS to do descriptive analysis, reliability analysis, correlation hypothesis, and validity analysis to mine the deep content behind the surface data. As an important basis of this data analysis,

the author must introduce the basic principle of the software before the experiment. The basic principle of data analysis in this study is the hypothesis test. Firstly, it is assumed that the content of the questionnaire has no effect on memory strategies.

The design of this questionnaire follows the rules of the Likert five scale, so SPSS can be used for reliability and validity test. Validity of data after data collection shall be eliminated first to ensure the accuracy of the data. The analysis steps are as follows:

**4.1 Enter questions and data**

Type setting value in the variable view interface one by one. It should be noted that in the connection between the questionnaire and SPSS, we need to use some codes to turn the respondents' answers into analyzable data. Set Very Agree to NO.1; Agree to NO.2; Neutral to NO.3; Disagree to NO.4; Very Disagree to NO.5. Using digital coding to represent the magnitude of Likert scale in data analysis software will bring a lot of convenience to the later research. Similarly, just input the whole questionnaire.

**4.2 Descriptive analysis**

This study takes descriptive analysis as the first step of analysis.

In this way, the author can have a general understanding of the overall situation and background information of the data, which will become the basis of subsequent analysis. In this study, descriptive analysis mainly involves the age, grade and gender of the respondents. According to the author's preliminary analysis, grade will be an important factor to distinguish the survey results, because grade means the degree of students' accumulated knowledge and rich learning experience. Using analysis software to describe the overall situation of the questionnaire can grasp the distribution of respondents and delineate more detailed research objects for the research.

**Table 1.**Description and analysis of basic information of respondents

	N	Scale	Min	Max	Standard Deviation	Skewness		Kurtosis	
Grade	30	1.00	2.00	3.00	.47946	-.745	.427	-1.554	.833
Gender	30	1.00	1.00	2.00	.46609	-.920	.427	-1.242	.833
Age	30	2.00	1.00	3.00	.58722	.000	.427	.230	.833
Valid N (listwise)									

The above descriptive analysis provides the following information:

The 30 questionnaire reports range from grade 1 to grade 3 of senior high school. The distribution of male and female is basically balanced, and the age is evenly distributed based on grade.

**4.3 Reliability**

The significance of the results of reliability analysis to this questionnaire is to reflect its interpretation of the research questions. If each question in the four dimensions of learning attitude, learning style, learning difficulties and learning experience involved in the questionnaire has feedback effect on word learning strategies and cognition, the reliability will be at a high level. On the contrary, if the value is not ideal, each dimension should be tested separately to identify the questions with low reliability and modify or delete them. In fact, in order to ensure that the analysis results are fully persuasive, this study tested the four dimensions and summarized the test results.

In the interpretation of reliability results, we mainly look at  $\alpha$  Value (Alpha).

When  $A < 0.7$ , that means the reliability of the designed questionnaire is unreliable, we cannot further

analyze materials which has reliability less than 0.7. The reliability in the range of 0.7 to 0.8 is at a medium level can be used for next analysis. The reliability above 0.8 can be said to be a very ideal analysis material.

**Table 2.** Reliability statistics

Cronbach's Alpha	Items
.909	20

The result of this questionnaire Alpha=0.909, the reliability of the questionnaire is persuasive, the questions have good correlation, and there are few contradictions in the answers of the respondents. This reliability means that there is a good correlation between the four dimensions designed in the questionnaire and the questions to be verified. We can take the results of these questionnaires as part of the validation empirical research and carry out further research on this basis.

Next, the reliability of the questionnaire will be analyzed in detail according to the four dimensions of thinking about learning words, the way of word memory, the attitude of learning words and the difficulty of learning words.

**Table 3.** Reliability statistics

Cronbach 的 Alpha	Standard Cronbach's Alpha	Items
.804	.813	5

**Table 4.** Project total statistics

	Scale average (if item deleted)	Scale variance (if the item deleted)	Total number of items after correction	Square complex correlation	Cronbach 's Alpha(if the item deleted)
Q1	8.5000	8.121	.724	.618	.725
Q2	7.8000	7.959	.525	.335	.798
Q3	8.3333	8.851	.531	.401	.784
Q4	8.9000	9.541	.523	.463	.786
Q5	8.6000	8.524	.696	.644	.737

The reliability analysis result of five items of thinking dimension of learning word experience in the first

dimension is 0.804. Generally speaking, if the Alpha value is greater than 0.4, it can be considered as a qualified design. Therefore, the design of learning experience in the first dimension meets the requirements. In particular, it depends on the Alpha value after deleting the unqualified items. This value is 0.725, which is also in line with the requirements. Next, we will test the reliability of the four dimensions of this questionnaire to provide tool support for further optimization of the results.

The results of reliability analysis of the four dimensions are summarized as follows:

**Table 5.** Results of reliability analysis of the four dimensions

Total $\alpha$	Dimension $\alpha$	if the item deleted $\alpha$
$\alpha = .897$	$\alpha 1 = .804$	.725
		.798
		.784
		.786
	$\alpha 2 = .524$	.737
		.428
		.719
		.349
	$\alpha 3 = 0.550$	.282
		.597
		.608
		.387
	$\alpha 4 = 0.722$	.270
		.572
		.703
		.679
		.690

Dimension 1: Reliability of thinking level of learning word experience  $\alpha 1$ ;

Dimension 2: Reliability of word memory  $\alpha 2$ ;

Dimension 3: Reliability of attitude towards learning words  $\alpha 3$ ;

Dimension 4: Reliability of difficulty in learning words  $\alpha 4$ .

Based on the above summary results, we can draw the following conclusions: the reliability analysis results of 9 questions in these 2 dimensions of learning word experience and learning difficulty are better than those in

the dimension of memorizing word attitude and memorizing word difficulty, The result of  $\alpha 1$  and  $\alpha 4$  is a satisfactory part of the whole reliability test, but this does not mean that  $\alpha 2$  and  $\alpha 3$  are invalid, and they also have a certain persuasion to prove that the questionnaire results are within the acceptable range.

**4.4 Validity analysis and factor analysis**

The significance of KMO value to this study is to detect the correlation of common factors between variables. Variable design will be carried out after the dimension number is established in the above steep slope diagram. The results of variable design will be detected by KMO value. The maximum value of this statistical value is 1. The closer it is to 1, the greater the correlation. For this study: the greater the correlation of KMO value, it shows that there is a strong correlation between word learning style, word learning attitude, word learning difficulty and word learning experience. This correlation means that they can jointly reflect students' understanding of word learning. Whether it has this correlation is also an important index to measure the quality of questionnaire design.

**Table 6.** KMO and Bartlett verification

Kaiser-Meyer-Olkin		.639
	square	343.431
KMO and Bartlett verification	df	136
	sig	.000

KMO=0.639, indicating that this group of questionnaire data has some value.

Next, in order to understand the validity of each dimension, researchers need to analyse the validity of the original data in groups.

The grouping validity results are presented as follows:

**Table 7.** Grouping validity results

dimision1	KMO1=.665
dimision2	KMO2=.543
dimision3	KMO3=.472
dimision4	KMO4=.453

Through the reliability test results of the above four dimensions of experience, way, attitude and difficulty, we found that the two dimensions of learning experience and difficulty can be further analysed by factor analysis.

The results of **factor analysis** are as follows:

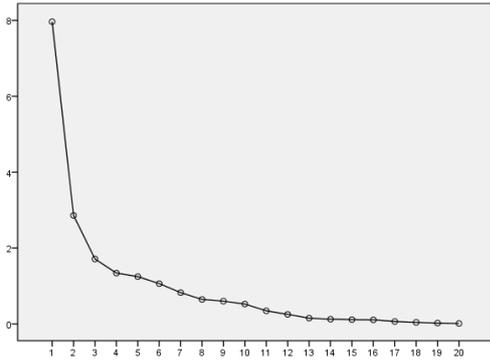


Figure 1. Steep slope map

The interpretation of this line chart mainly focuses on the inflection points in the chart, which can help us scientifically determine the number of dimensions.

4.4 Variance analysis

Table 8. Analysis of variance <sup>a</sup>

Modal	Sum of squares	df	Average <sup>2</sup>	F	sig
Regression	4.277	20	.214	.951	.563 <sup>b</sup>
Residual	2.023	9	.225		
Total	6.300	29			

a. Strain number: Gender

b. Predicted value: (constant): Q20, Q11, Q17, Q18, Q13, Q3, Q2, Q8, Q7, Q4, Q16, Q19, Q1, Q9, Q14, Q6, Q15, Q10, Q12, Q5

This group of analysis takes gender as the independent variable, and the results show that gender has little effect on the attitude and understanding of single word acquisition, which is in line with basic cognition.

This verification result is contrary to people's previous understanding. People's stereotype always thinks that girls' learning attitude is better. However, the results show that gender has little effect on learning attitude and academic achievement.

5. CONCLUSION

Through the above descriptive analysis, validity analysis, reliability analysis, regression analysis and correlation analysis, the author has a more detailed understanding of senior high school students' attitudes, strategies, methods and difficulties in memorizing words. High school students' experience and difficulties in word learning have a stronger influence on their understanding of word learning. Therefore, high school students should

Subjective determination of the number of dimensions may be plagued by cognitive limitations. In order to eliminate the subjectivity in the dimension selection of the questionnaire, we need to explain the situation with the help of the results of validity analysis. In the figure, it can be seen that the inflection point starts to flatten at the horizontal axis 7, indicating that the dimension number of the questionnaire can be established within 6. However, the selection of the final quantity should be determined according to the actual situation and operability. The information provided by validity can be used as a limited scope. If we choose more than seven dimensions, it will be regarded as a violation of reliability. From the perspective of questionnaire design, it will also greatly reduce the feasibility. In general, the steep slope map clearly presents the problem of quantity selection suggestions.

pay attention to accumulating experience and seeking help to overcome difficulties in word learning.

Although memorizing English words is a difficult problem for most students and needs to be repeated, as long as the teacher guides the students well, combined with the actual situation of each student, finds suitable ways and methods for them, applies them timely and innovatively, stimulates their initiative in memorizing words, improves their interest in memorizing words, and makes memorizing English words a happy thing. Scientific English word memory theory can help students get rid of rote learning, shorten memory time and improve their English level. In this way, we will get twice the result with half the effort. If we persist in it for a long time, we will be able to learn English well.

There are still many deficiencies in this study. In future research, the author can try to expand the sample range, enrich statistical analysis methods, further dig into the subject, and obtain more detailed understanding of the facts of word acquisition.

The theory of "Multiple Intelligences", which has attracted extensive attention in the world educational circles, was put forward by Mr. Gardner, a professor of psychology at Harvard University and an American developmental psychologist. It tells people that the difference between people is that everyone's intelligence combination is different, not the high and low, good and bad of individual intelligence, but the difference of combination structure.

Based on the above analysis, it can be concluded that word memory strategy refers to various means and methods applied by learners to realize word memory and learning. This strategy may be some more explicit actions observed by the outside world, and it may also be an activity of learners' own consciousness in the brain. The explanation of word memory strategies is mainly from the process of memory. The processing of information in the process of memory is actually the processing of words. Therefore, the relationship between word learning and memory strategies is both overlapping and inclusive.

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