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Location Dominance Effect of Implicit Memory in Test Sequences

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Implicit memory is a cognitive phenomenon. In specific cognitive processes, individual implicit memory produces a position dominance effect. The location of test sequence refers to the location of a single test item which is determined by the characteristics of the previous test item in a series of test items. The test items have two main characteristics: signal characteristics and noise characteristics. Different test sequence locations affect the initiation process of implicit memory through the sequence of signal and noise items, resulting in different effects of implicit memory. Neighborhood relation indicates whether or not two test items have common attributes. In the experimental study, the researchers used artificially-constructed colorless, meaningless English strings as experimental materials and used a two-factor mixed design to explore the effect of the relationship between the location of the test sequence and adjacent positions of individual implicit memory. The results show that there are significant differences in the implicit memory level of college students in different grades and in their implicit memory scores under different test sequence positions. The interaction effect between test sequence locations and adjacent relationships is significant. Hence, the location of test sequence and its adjacent position relationship produce a position advantage effect by influencing the implicit priming mechanism.

Keywords: Recognition Test, Neighboring Position Relationship, Test Sequence Location, Implicit Memory, Location Dominance Effect

1. INTRODUCTION

People forget the problems they have had, the activities they have performed, and the emotions they have experienced in their lives, but store them in their minds for a period of time, and can freely extract them in certain situations (Yang and Li, 2016). Implicit memory is a special kind of memory phenomenon: it is a cognitive state in which the past experience of an individual automatically influences the current task under the condition of intentional recall or without consciousness. It is a concrete manifestation of unconscious research in the field of memory. Unconsciousness refers to people's attention deviating from the initial content of processing, and points to unrelated objects in their mental activities (Dijksterhuis and Nordgren, 2017). Therefore, the study of implicit memory should start with unconscious exploration (Li, 2017). It wasn't until the discovery of the forgetting curve by German experimental psychologist Ebinhaus that research on the unconscious began. In this seminal study of memory, he created his own meaningless syllables and used these as experimental materials to measure and explore human unconscious memory by saving the learning method. This experimental paradigm has also been used by some contemporary researchers to study implicit memory (Guo, 2016). Following Ebinhaus, the research on the unconscious has lost some momentum due to the prevalence of behaviorism. British cognitive neuropsychologists Weiskrantzd and Warrington studied the effect of priming in amnesia patients in 1986. The results indicated that amnesia subjects showed a significant separation of memory effects in the recognition memory test. Moreover, they could not consciously memorize the learning content in the recognition memory and could not recognize the previous long-term memory.

However, in the supplement test, it showed the same memory effect on ordinary people. The discovery of this special memory phenomenon has once again aroused scholars' enthusiasm for research on unconscious memory. At the end of the twentieth century, psychologists Graf and Chacter proposed the concept of implicit memory to describe the advantageous effect of prior learning or experience in

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Table 1 Examples of Signal and Noise Items.

Learning project	Test items	Signal item	Noise item
ERAG (Red)	ERAG (Red)	ERAG (red)	
ERAG (Red)	ERAG (purple)		ERAG (purple)
ERAG (Red)	ERTG (Red)		ERTG (red)

Table 2 Examples of Test Sequence Location Types.

Test sequence number	Test items	Signal item	Noise item	Sequence Location Type
1	ERAG (Red)	ERAG (red)		
2	KLDS (Red)	KLDS (red)		Signal-signal
3	ERAG (purple)		ERAG (purple)	Signal-noise
4	CSKL (blue)		CSKL (blue)	Noise-Noise
5	ERAG (Red)	ERAG (red)		Noise-signal

unconscious situations. At the same time, an experimental procedure of task separation was used to distinguish explicit memory from implicit memory, and an experimental method was used to prove that implicit memory is an independent, unconscious memory system (Meng and Guo, 2016; Guo, 2016). Since then, implicit memory has become a focal study in cognitive psychology (Raanaas and Magnussen, 2006). With the development of psychology localization in the 1980s, Chinese psychologists began to study implicit memory. In the following decades, this research achieved fruitful results, and a large number of outstanding researchers, such as Xu Dazhen, Ye Maolin and Liu Yongfang, have emerged. They have used creative research methods to explore implicit memory from different perspectives,Which promotes the development of implicit memory(Meng and Guo, 2017).

Implicit memory is a research topic in the field of human cognition. It has both abstractness and generality. Its influencing factors are extensive and hierarchical and naturally become variables that need to be considered or excluded in experiments involving implicit memory. The research results in China and abroad indicate that these experimental variables can be roughly classified according to the following four factor categories: (1) Factors of experimental materials: Type of experimental materials (numbers, letters, Chinese characters, graphics, etc.), memory load (capacity of experimental items), duration of stimulus presentation, stimulus specifications (length, width, area, volume, etc.), and stimulus representation (bitmap, vector form); (2) External environmental factors: artificial experimental environment, natural experimental conditions and so on; (3) Organic factors: age, sex, occupation, educational level, handedness tendency, attention level, cognitive style, emotional state, motivation level personality dimension, personality characteristics; and (4) Experimental operational factors: processing type of experimental tasks, coding level, processing level, extraction method, learning level (Qu and Guo, 2015; Rohit and Rajendra, 2019; Neha and Somya, 2019; Fengwei and Xiuqing, 2019).

However, implicit memory is a complex, high-level cognitive process since the influencing factors are diverse. This paper explores the influence mechanism of the location and sequency of *items* on a test (Meng and Guo, 2017).

2. METHODS

2.1 Experiment 1: The Influence of Different Test Sequence Types on the Dominance Effect of Implicit Memory

2.1.1 Participants

In this study, 96 undergraduates were selected by the random sampling cluster method. There were 24 undergraduates in each grade, the ratio of male to female was about 1:1, and the age range was 18–24 years. Participation was voluntary. All participants had no color weakness or color blindness, and their vision or corrected vision were normal. The participants were divided into 12 groups consisting of eight subjects per group.

2.1.2 Experimental Design

The experiment was designed with 4 types (Test sequence type: signal-signal, signal-noise, noise-signal, noise-noise) *4 grade (Grade: freshman, sophomore, junior and senior).

2.1.3 Experimental Equipment and Materials

The following equipment was used for the experiment: eight computers, E-prime 2.0 for experiment programming. The participants responded to the test items by pressing keys and recording the correct rate of the test. The experimental material library consisted of 90 color meaningless English strings, 36 of which were signal test items, and 54 were noise test items. These color English strings consisted of 12 meaningless English strings matched with 12 colors. The meaningless English strings were randomly composed using 26 English letters. The strings were all in block 18 and all the fonts were upper case. Twelve colors were fixed: red, yellow, green, cyan, blue, purple, brown, sour orange, aqua green, olive and dark yellow. Colour and letter combinations are two characteristic dimensions of experimental materials. The combination of letters and colours of the learning items that appeared in the test items are consistent with those of the learning items. According to the two adjacent test items, signal or noise can constitute four sequence position types:

signal-signal, signal-noise, noise-signal and noise-noise. For all test items, if two adjacent test items have common characteristics, they are known as'related'. However, the two test items are viewed to be unrelated. The relationship between signal items, noise items, test sequence positions and adjacent items in the experimental materials is illustrated below.

In this experiment, 24 of the 72 strings in the experimental material library were randomly selected as test items, comprising 12 signal test items and 12 noise test items. Then, the target items were randomly divided into two groups as the content of word list 1 and list 2. Finally, 12 signal test items and 12 noise test items were grouped together and then divided into four categories: signal-signal, signal-noise, noise-signal, noise and noise. Each group has six items (Ji, 2016).

2.1.4 Procedure

The experiment has two stages: learning and testing.

(1) Learning stage. The test was conducted in a quiet laboratory. Each group of subjects was divided into four groups according to their academic grades. Each group was tested separately. The instructions for this stage were: "Hello, everyone. Welcome and thank you for participating in this test. Next, you will see two words on the computer screen one after the other. The words are presented in 2 cm × 3 cm rectangular boxes. Each word has six colored but meaningless English strings. You need to remember their respective letter combinations and colors for subsequent memory tests. After you remember, you can press any key to begin the test."

(2) Testing stage. The test was divided into two stages. The first stage was the inclusion test and the second stage was the exclusion test. Both tests were controlled by instructions. For each test stage, 24 test items were presented in turn, including 6 signal items learned from vocabulary, 6 signal items learned from the vocabulary and 12 noise items not learned. Test instructions were: "Hello, everyone. Next, the computer screen will show some test items in turn, some of which are colored strings on the first word you have seen, some of which are colored strings on the second word you have seen, and some of which are colored strings on the second word you have not seen. If you think the item presented is a string you have seen in the two lists, and the combination of letters and colors are the same, press the 'Y' key. If you think the item presented is something you haven't seen before, press the 'N' key. The exclusion test guidelines are as follows." Hello everyone. Next, the computer screen will show some test items in turn, some of which are colored strings in the first word list you have seen, some of which are colored strings in the second word list you have seen, and some you have not seen (Chen, 2016). If you think the presented item is a string in the second word you have seen, and the combination of letters and colors are the same, press the 'Y' key. If you think the rendered item is a string in the first word or you have not seen it before, press the 'N' key.

2.2 Experiment 2: The Influence of Dominance Effect of Implicit Memory Under Different Adjacent Relationships

2.2.1 Participants

In this study, 24 university undergraduates were selected by random sampling. The ratio of male to female students was about 1:1 and the ages were 19–23 years. Participation was voluntary. Their visual acuity or corrected visual acuity met the requirements of the experiment; hence, they had no color blindness or color weakness. The subjects were tested in three batches.

2.2.2 Experimental Design

The experiment was designed with 4 type (test sequence type: signal-signal, signal-noise, noise-signal, noise-noise) ×2 relationships (adjacent test item relationship: correlation, irrelevance). Therefore, the whole experiment was divided into eight treatment groups, to which 24 subjects were randomly assigned.

2.2.3 Experimental Equipment and Material

Experimental equipment: eight computers, using E-prime 2.0 programming. Explain concretely with experiment 1. This experiment randomly selected 12 signal test items from 72 strings in the experimental material library, which were divided into two groups randomly as the content of word singleton and word two. Then, 12 meaningless color strings that had been constructed were selected as noise items for the test phase. The 24 test items were divided into signal-signal, signal-noise, noise-signal and noise. There were six items in each group, and the relationship between two adjacent test items was constructed. There were 6 items in each group.

2.2.4 Procedure

This experiment followed the same procedure as experiment 1.

2.2.5 Process

The same process was used as for experiment 1.

3. RESULTS

3.1 Experiment 1: The Influence of Different Test Sequence Types of the Dominance Effect of Implicit Memory

3.1.1 Data Processing and Analysis Method

Firstly, the experimental data were collected and summarized, and the inclusion and exclusion scores of each group were calculated. Then, according to the calculation formula of PDP revised simplified model, the conscious extraction scores R and automatic extraction scores A of each group were calculated, and the automatic extraction score A was used

Table 3 Mean and Standard Deviations of Implicit Achievements for Four Grades Under Different Test Sequences ($M + SD$).

Test sequence	Grade			
	Freshman	Sophomore	Junior	Senior
Signal-signal	0.31 + 0.39	0.19 + 0.03	0.36 + 0.02	0.23 + 0.02
Signal-noise	0.30 + 0.01	0.21 + 0.06	0.35 + 0.01	0.18 + 0.01
Noise-signal	0.32 + 0.04	0.21 + 0.01	0.33 + 0.03	0.21 + 0.02
Noise-Noise	0.24 + 0.08	0.20 + 0.04	0.32 + 0.01	0.15 + 0.13

Table 4 Variance Analysis of Implicit Memory Achievements of College Students in Different Grades at Different Test Sequence Locations.

Source of variation	*SS*	*DF*	*MS*	*F*
Grade	0.02	3	0.01	3.36*
Sequence Location Type	0.15	3	0.05	18.73**
Grade × Sequence Location	0.02	9	0.01	0.81
Esidual	0.20	76	0.02	

Note: * $P < 0.05$ ** $P < 0.01$

as the scoring index of implicit memory. Then the data were imported into SPSS, and analyzed using two-factor repeated measurement variance analysis (Mulligan et al., 2016).

3.1.2 Descriptive Statistics of Implicit Memory at Different Test Sequence Locations Under Two Kinds of Neighboring Relations

The formula of the PDP revised simplified model was applied to calculate the automatic extraction component A of each participant under different test sequences, and A was used as a measure of implicit memory performance. The average implicit memory score of the 22 freshmen was 0.31 under signal-signal test sequence, signal-noise test sequence was 0.32, noise-signal test sequence was 0.30, and noise-noise test sequence was 0.24. On average, freshmen had the best implicit memory performance under signal-signal sequence, followed by noise-signal sequence and signal-noise sequence, while noise-noise sequence had the worst implicit memory performance. However, whether the differences were significant among the four types of sequence types remains to be analyzed by variance (Guo et al., 2013). Under signal-signal, signal-noise, noise-signal and noise-noise sequence, the average implicit memory scores of junior students are 0.04, 0.05, 0.01 and 0.08 higher than those of freshmen respectively. However, further variance analysis is needed to decide whether the differences are statistically significant, and whether the interaction of grades and gender is significant.

3.1.3 The Influence of the Relationship Between Different Test Sequence Locations and Adjacent Test Items on Implicit Memory

The results of the variance homogeneity test are: $(20, 24) = 1.21$, $P = 0.318$, that is > 0.05. The results showed the homogeneity of variance among groups, which aligns with the basic assumptions of variance analysis. Therefore, the data of this acceptance set could be used for variance analysis.

The results of variance analysis showed that the main effects of grade ($F\ (3, 87) = 3.36$, $P < 0.05$, $\eta^2 = 0.63$) and sequence position type ($F\ (3, 87) = 18.73$, $P < 0.01$, $\eta^2 = 0.51 = 0.51$) were significant, while the interaction of grade and test sequence location type was not significant ($F\ (9, 87) = 0.81$, $P > 0.05$). According to the mean profiles of implicit memory scores and the descriptive analysis of the subjects' performance under different sequence positions in different grades, the grades of junior students are higher than those of freshmen, sophomores and senior students, and the differences are significant. For the sequence position type variables, the signal-signal sequence, signal-noise sequence, noise-signal sequence, noise-noise sequence are significant. There was a significant difference in the results. However, further post-test multiple tests are needed to determine which two types of test sequences have significant differences of location (Rugg et al., 2013).

3.1.4 Multiple Comparisons of Implicit Memory Scores of College Students of Different Grades at Different Test Sequence Locations

3.1.4.1 Post-Test Multiple Testing (LSD) for the Location of Test Sequences

The results of the LSD test on the position variables of test sequence (see Table 5) show the difference between the two positions of four kinds of test sequence are significant, indicated by the significant difference between the position of signal-signal sequence and that of signal-noise sequence, and the significant difference between the position of signal-signal sequence and that of noise-signal sequence. Combining these results with the previous descriptive statistics, we can see that the performance of signal-signal sequence location is the best, followed by noise-signal, signal-noise, and finally noise-noise sequence location. The performance of this sequence location is the worst.

3.1.4.2 The influence of grade on implicit memory

The results presented in Table 5 show that the main effect of the grade variable is significant. Combining these results with the average value of implicit memory under different test rank positions in each grade, we see that the scores of junior students are significantly better than those of other three grades. However, it is obvious from Figure 3.2 that the

Table 5 Post-Test Multiple Test Results for the Location of Test Sequences.

	MD	*SE*	*P*
Signal-Signal-Signal-Noise	0.089	0.015	0.000**
Noise-signal	0.051	0.013	0.001*
Noise-Noise	0.105	0.014	0.000**
Noise-Signal-Signal-Signal	−0.051	0.013	0.001*
Signal-noise	0.038	0.015	0.014*
Noise-Noise	0.054	0.016	0.001
Noise-Noise-Signal-Signal	−0.105	0.021	0.000
Signal-noise	−0.017	0.014	0.277
Noise-signal	−0.054	0.014	0.001

Note: * $P < 0.05$ ** $P < 0.01$

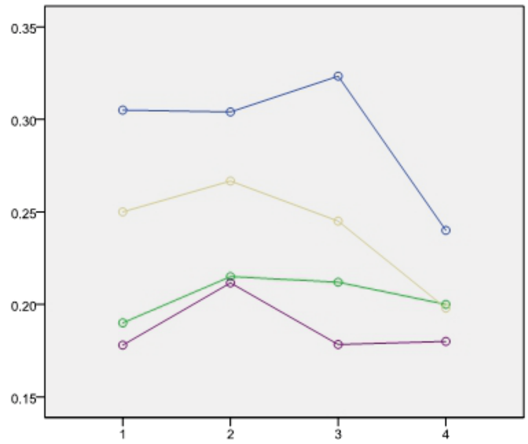

Figure 1 Average Profile of Implicit Memory Achievements of College Students in Different Test Sequences.
Note: The horizontal axis is grade; The vertical axis is implicit memory score (R), and the sequence position types 1–4 are signal-signal, signal-noise, noise-signal and noise-noise. The sequence position types represented by the top-down lines in the figure are 1, 3, 2 and 4.

performance of relative signal-to-signal test sequences differs slightly under the other three types of sequences.

3.2 Experiment 2: The Influence of Test Sequence Location on Dominance Effect of Implicit Memory Under Different Adjacent Relationships

3.2.1 Data Processing and Analysis Method

The specific treatment and analysis method are the same as experiment 1.

3.2.2 Descriptive Statistics of Implicit Memory in Different Test Sequences Under Two Kinds of Neighboring Relations

For the 24 college students, when the relationship is correlated between two adjacent test items, the average implicit memory score is 0.32 under the signal-signal test sequence, the average is 0.21 under the noise-signal sequence, the signal-noise sequence is 0.18, and the noise-noise sequence is 0.15. On average, when the relationship is correlated between two adjacent test items, the subjects' implicit memory performance is the best under signal-signal sequence, followed by noise-signal sequence and signal-noise sequence, while the implicit memory performance is the worst in noise-noise sequence. However, whether the difference in performance between the four types of sequence types is significant, needs to be tested by variance analysis in the next step. Comparing the average scores of implicit memory under the correlated and unrelated conditions, it was found that there was little difference between the two correlations. Under the signal-signal, noise-signal and noise-noise sequence, the implicit scores were 0.07, 0.03 and 0.03 higher than those without correlation, while under the signal-noise sequence, the implicit scores were 0.03 lower than those without correlation. However, under these two kinds of relationships, whether the difference of achievement achieves a significant level still needs to be tested by variance analysis.

3.2.3 The Effect of the Relationship Between Different Test Sequences and Adjacent Test Items to Implicit Memory

The results of the homogeneity test of variance showed that F $(7, 16) = 1.213$, $p = 0.24$, $P > 0.05$. Hence, the homogeneity of variance among groups was aligned with the basic assumptions of variance analysis, so the data of this acceptance set could be used for variance analysis.

The results of variance analysis showed that the main effects of adjacent relationship (F $(1, 22) = 44.458$, $P < 0.01$, $\eta^2 = 0.51$) and test sequence location type (F $(3, 20) = 11.998$, $P < 0.01$, $\eta^2 = 0.61$) were significant, and the interaction

Table 6 Mean and Standard Deviations of Implicit Achievements of Different Test Sequences under Two Kinds of Neighboring Relationships ($M + SD$).

Test Sequence Location	Neighboring Test Item Relationships	
	Relevant	Irrelevant
Signal-signal	$0.14 + 0.012$	$0.13 + 0.02$
Signal-noise	$0.32 + 0.013$	$0.16 + 0.04$
Noise-signal	$0.13 + 0.014$	$0.12 + 0.01$
Noise-Noise	$0.21 + 0.026$	$0.10 + 0.01$

Table 7 Variance Analysis of Implicit Memory Achievements of Different Test Sequences Under Two Kinds of Neighboring Relations.

Source of variation	*SS*	*Df*	*MS*	*F*
Adjacency relationship	0.038	1	0.038	44.458**
Sequence Location Type	0.030	3	0.010	11.998**
Relation * Sequence Location	0.016	3	0.005	6.271**
Residual	0.014	16	0.001	

Note: $**P < 0.01$

Table 8 Simple Effect Analysis of Neighborhood Relations and Test Sequences.

Source of variation	*SS*	*DF*	*MS*	*F*
Test Sequence Location Type				
Relevant	0.03	3	0.01	34.41**
Irrelevant	0.02	3	0.01	11.32**
Neighboring Test Item Relationships				
Signal-signal	0.04	1	0.04	14.24
Signal-noise	0.02	1	0.02	11.21**
Noise-signal	0.02	1	0.02	13.24
Noise-Noise	0.02	1	0.02	14.13**

Note: $**P < 0.01$

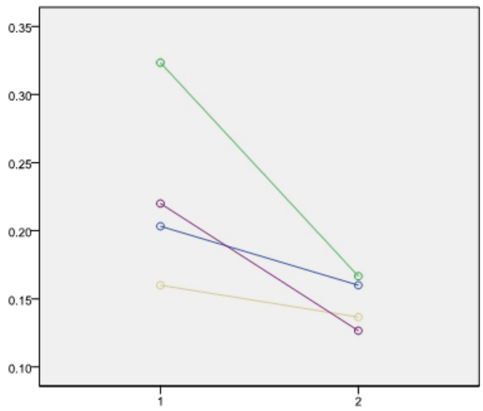

Figure 2 Interaction Diagram of Test Sequence Location and Adjacent Relationship.

Note: The horizontal axis is the relationship between adjacent items, where 1 is correlated and 2 is irrelevant; The vertical axis is the implicit memory score (R), and the sequence position types 1–4 are signal-signal, signal-noise, noise-signal and noise-noise, respectively. The sequence position types of the left end of the line in the figure are 2, 4, 1, 3 from top to bottom.

between adjacent relationship and sequence location type was significant (F $(3, 22) = 6.271$, $P < 0.01$, $\eta^2 = 0.52$). Next, we conducted a simple effect analysis of the adjacent relationship and the location of the test sequence and to determine their interaction.

According to the analysis of the average value of the relationship between adjacent test items in the position of signal-noise test sequence, the average value of implicit memory is 0.12 for the correlation dimension, and the average value is 0.10 for the irrelevant dimension. It can be concluded that the performance of signal-noise test sequence location is higher than that of the unrelated dimension 0.01, and the difference is statistically significant. According to the average value of the adjacent test item relationship in the position of noise-noise test sequence, the average value of implicit memory in the correlation dimension is 0.21, and the average value is 0.13 in the irrelevant dimension. It can be concluded that the performance of the signal-noise test sequence location is higher for the relevant dimension than for the irrelevant dimension (0.07), and the difference is statistically significant. In a word, besides the interaction of descriptive statistical analysis table and simple effect analysis table of adjacent relationship and test sequence location, the interaction graph gives a visual representation of how adjacent relationship and each level of test sequence interact.

4. DISCUSSION

4.1 Theoretical Model of the Effect of Location and Adjacent Relations of Test Sequences on the Advantage Effect of Implicit Memory

From the results of this study, it is evident that the location of test sequence and its adjacent relationship have a significant impact on implicit memory. But how do these two variables affect the dominant effect of implicit memory? Based on previous studies, the author believes that the essential reason for the influence of test sequence location and adjacency on implicit memory is the role of the intermediate priming effect, which was common to the two experimental processes (Hamann and Squire, 2016). Moreover, there are two theoretical models to explain this. The first theoretical model is a two-process model; that is, after learning all the test items, the subjects will process the characteristic dimensions of these items and recall the similar items they have learned before (Rotello et al., 2014). In experiments 1 and 2, the subjects first learned the test items for a period of time and, in the testing stage, the test items were presented to the subjects again in a certain sequence. At this time, the subjects only need to recall the learning items similar to the test items, but not all the learning items (Deacon and Hewitt, 2014). If the participants remember all the characteristics of the test item, they can judge the next test item according to the type of test sequence location. In this process, the common dimension features act as the starting source of the intermediate priming effect. On the one hand, the former test item generates links; on the other hand, the participants' judgment of the next test item is also initiated. The recall of the second test item produces an intermediate priming effect, which is precisely the intrinsic measure of implicit memory. The greater the priming effect, the more obvious the dominant effect of implicit memory (Penney et al., 2017).

Another theoretical model to explain the intermediate priming effect is the iterative resonance model, which differs from the two-process model in that it uses a single-process model to obtain the information base (Henson, 2016). Under the influence of this model, the participants first processed the overall characteristics of the test items, and then the characteristics of each test item gradually became clear and specific (Decarlo, 2017). In the Iterative Resonance Model, the subjects only need to judge the characteristics of the test items. If they find that all the characteristic dimensions of the two related test items are inconsistent, the subjects will make negative judgments, such as ERAG (purple) and CSKL (red), which are not consistent in terms of color dimension and letter combination dimension. The subjects accept ER. After the AG (purple) test project, it is easy to make a negative judgment on the next test project CSKL (red) (Hintzman and Curran, 1994). In the Iterative Resonance Model, each test item has a series of dimension characteristics. The test items with the same characteristics will automatically resonate with the previous learning items and form a certain link (Nessler, 2015). To illustrate this problem: resonance is just like resonance in instrumental music. When a key on the piano resonates with the tone frequency that matches it, people will have a facilitation effect on similar tones. Returning to this study, in the test stage, if the test item and the learning item have common characteristics, that is, the intermediate priming effect. If the resonance occurs for a long time, the priming effect will be greater and the implicit memory performance will be better (Castel et al., 2016). This conclusion provides insight on practical teaching and learning, as general knowledge and experience can also have an impact on implicit memory. If the theoretical basis of one test item is consistent with that of another test item, students will facilitate the memory of one test item (Mcgillivray and Castel, 2016). Therefore, in normal teaching activities, students will have a facilitative effect on the memory of the test item. Teachers need to cultivate students' basic knowledge so that students can take full advantage of implicit memory (Mcbride and Dosher, 2016).

4.2 Comprehensive Application of Location Advantage Effect of Implicit Memory

In this study, two experiments were designed to explore the test arrangement that had the greatest effect on the implicit memory of college students. The first experiment examined the influence of the subjects' grade and the location of test sequence on implicit memory. The second experiment constructed a new variable: the relationship between two adjacent test items, and mainly discussed the relationship between adjacent relation and the location of test sequence on the basis of experiment 1. The effect of implicit memory (Johns, and Mewhort, 2016). The results shows that the influence of test sequence location is very significant under both experimental designs. Specifically, the implicit memory performance of signal-signal and noise-noise test sequence location is significantly better than that of signal-noise and noise-signal test sequence. The effect of test sequence location on implicit memory has also been validated in empirical studies by other scholars. In the cognitive system, the different order in which stimuli are presented will have different effects on the individual. According to the time stage of stimulus presentation, the order of stimulus presentation can be divided into two categories: project learning order and test order. There are many empirical studies on the influence of learning order on implicit memory, and some valuable conclusions have been drawn, such as the memory series location effect, which refers to the best memory effect of the first and recent memory items, where the former is the primary effect, and the latter is the proximal effect. However, the research on the effect of test sequence on implicit memory needs to be further enriched (Andrew and Yonelinas, 2015). In this study, the author designed a series of test sequences according to the type of correlation and the type of test sequence location. It was found that the position of test sequence had the greatest influence when the two adjacent test items were correlated.

This study has provided several important insights. In the actual teaching and learning process, especially in the college oral examinations, we should design the test sequence scientifically and reasonably, and arrange the questions so that those based on common knowledge are placed together. However, at present, college speech tests focus on examining students' level of comprehension, and pay less attention to thematic tests. Instead, a more reasonable approach is to combine the comprehension test with the thematic test. In the early test, the thematic and modular test should be the main method. Implicit memory and improve their academic performance. As far as the current teaching of oral language is concerned, some teachers may not systematically consider the organizational nature of the teaching content and ignore the influence of the test sequence on student learning. Therefore, in teaching, we should constantly innovate the sequence of test questions to make it more suitable for the cognitive characteristics of contemporary college students and improve their implicit memory level (Kahneman, 2016). For example, teachers can design the learning sequence of the teaching content on the one hand, and then design the testing sequence of the content according to the specific situation of students' learning on the other hand, so that the subjects can recall the content of the learning stage in the testing stage. In this way, learning and testing can be combined, and this combined role can improve the teaching efficacy of university teachers and the learning of students.

5. CONCLUSION

In summary, when the adjacent test items were correlated, the implicit memory scores of undergraduates at the signal-noise and noise-noise test sequence positions were significantly higher than those of students in the other two categories. When the adjacent test items are independent, the implicit memory performance of signal-noise and signal-signal test sequences is significantly higher than that of the other two types of sequences. The interaction between the location of the test sequence and the adjacent relationship is significant, which is manifested in that under the relevant conditions, the performance of the noise-noise sequence is higher than that of the signal-noise test sequence under the unrelated condition; under the unrelated condition, the implicit memory performance of the noise-signal test sequence is significantly lower than that of the signal under the correlated condition - signal test sequence position.

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