Two-dimensional Study of the Interaction between Interpreting Working Memory and Anxiety

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Abstract. Interpreting is a kind of information processing with different dimension involved in it. Among the different dimensions, working memory has a primary position. At the same time, there are complicated emotions in this process. In the different emotion, anxiety took place frequently. The thesis focuses on the study of relationship between different dimensions in the information process. A theoretical approach is taken to depict the interaction among various cognition and emotion. This thesis suggests and assumption that anxiety takes bigger part to the quality of interpretation than working memory. Based on this assumption, an experimental method is taken to prove it. In the end, we find that low level of working memory is easy to cause higher interpreting anxiety and then lower quality of interpreting; On the contrary, higher level of working memory cause lower anxiety and better interpreting performance. In conclusion, interpreting performance is more constrained and influenced by interpreting anxiety.

Introduction

Interpretation is a process of information processing. In this process, including the language information, context information, cultural information, psychological information, emotional communication, aesthetic taste and customer recognition and other integrated in one of the communication activities. But also the process of individual and multi-party information exchange, environmental interaction. Interpreting has a higher demand for working memory. The same is the English and Chinese are very skilled people, without vocational training in the case of interpretation, interpretation of the output performance will be very limited. And after the interpretation of professional interpreting interpreters will have a good performance. The key to professional interpreting training is to train bilingual proficient information analysis and understanding of memory, information reproduction and expression. These abilities are the main features of working memory. Changes in emotional experience also constrain or facilitate the development of interpretation techniques. How does working memory act on interpreting anxiety and ultimately control the quality of interpreting output? This paper examines the specific impact of working memory and anxiety on the quality of interpretation. It has a certain theoretical significance and practical operational value to explore the mechanism of interpreting cognitive processing, improving the teaching method of interpreting and improving the effect of interpreting practice.

The Literature Review on Work Memory and Interpretation Anxiety

Internationally, modern interpretation research began in the late 1980s, has been developed to the interpretation of the "emerging period." The current research is more attention to the relevant

scientific research and began to cooperate with the relevant disciplines, more open field of vision, scientific research to enhance and there have been a considerable number of empirical research results (Zhong Weihe, 2012). In addition, interpreting studies begin in-depth interpretation of internal mechanisms, interpretation capacity structure and interpretation of information processing. Through the theory of combing, we summed up the interpretation capacity not only includes the cognitive development process interface, but also accompanied by emotional interface, in the two interfaces have different dimensions. Since the 1970s, the study began to focus on emotional factors that affect interpretation. Different emotions such as motivation, self-confidence, anxiety and other dimensions, interpretation anxiety (interpretation anxiety) problem are relatively new topic of academic circles. Interpreting learning and interpreting anxiety in combat is always a common problem. Horwitz et al. (1986) proposed the concept of "foreign language anxiety", on which researchers began to pay attention to and study the question of interpreting anxiety. Chiang Chiang (2006) has developed a special interpretation anxiety test scale. Research on interpretation anxiety is still in-depth.

Working memory refers to a system of limited capacity, used to temporarily maintain and store information, is the interface between perception, long-term memory and action, and therefore is a basic support structure of the thinking process (Zhong Jie, 2010). Working memory directly affects the re-extraction process of interpreting information, and indirectly restricts the fluency of the whole process of language information processing. Chen Liwen (2011: 127) that the interpretation of memory memory processing is an important cognitive mechanism of the process of interpretation. Communication and simultaneous interpretation in the memory processing program reflects the difference between the characteristics, but whether it is cross or simultaneous interpretation of its memory operation of the conceptual nature is the same. Foreign (Miller, Miller, 1956: 81) argues that the information capacity for short-term memory is 7 ± 2 chunks, which is relatively constant; the chunk approach is to combine small memory units into large of the unit, can expand the capacity of short-term memory; short-term memory capacity is limited, and vulnerable to interference; short-term memory of the information can be converted into long-term memory system. In 1974, Baddeley and Hitch proposed the three-system concept of working memory on the basis of simulating short-term memory impairment. Working memory is a limited memory system that temporarily processes and stores information and plays an important role in many complex cognitive activities. (Xiao Xiaoyan, 2001: 33-36) It can be seen that memory is a very important intermediate link in interpreting activities and will play a key role in the success of interpreting.

The process of interpreting information processing is divided into two main interfaces: interpreting cognitive ability and interpreting emotion. At present, the combination of cognitive factors and emotional factors is still relatively small, the work memory and interpretation of anxiety combined research is a new attempt. Through the observation of the performance of interpretation anxiety, based on the role of working memory from interpretation anxiety, the study of interpreting work memory on the role of interpretation anxiety. Jiménez et al. (2002) studied the relationship between interpretation and interpretation, such as anxiety (stress) control, short-term memory and rapid response, and found that only rapid response significantly affected interpretation. Through multiple comparisons, it was found that the interpreting performance of the subjects with low levels of interpreting ability was significantly lower than that of the general and the high level. At the same time, lost or unable to convert information, resulting in information output failure or even anxious and unable to speak out. Low anxiety and high anxiety, the same will interfere with the brain's cognitive process, prolong the reaction time of the brain, there will be a myriad of abnormal phenomenon.

In addition, Shen Mingxia and Liang Junying (2015) in the comparison of professional translators and student translators in the study, found that working memory and non-working memory factors exist in the relationship between the interdependent, due to the distribution of working memory resources and the same information in the reception, understanding, conversion, output and other steps are closely related to the completion of the speed, so the working memory resources and simultaneous interpretation of these steps to complete the speed of non-working memory factors exist and mutual influence, including listening comprehension, semantic extraction, language conversion Ability, language skills and so on. Therefore, in the same language teaching needs to improve the student translator of these ability to work memory resources allocated to the information input, understanding, conversion, output and other links, and these links affect other non-working memory factors constitute online interaction, auxiliary completion sound transmission of the various steps to form the corresponding memory resource allocation efficiency. In view of this, teachers should pay attention to the effective allocation and coordination of students' working memory in simultaneous teaching and training, shorten the completion time of each step, and improve the distribution of working memory resources. In this way, teachers should pay attention to the working memory ability, efficiency, thereby improving performance.

The factors that affect the success or failure of interpretation work are diverse. Interpreting through the multi-channel input, in the interpretation of information into the process of working memory, the translator's attention, emotional control, different accent English listening ability and visualization process will have some impact on the translator. The interpreter's output relies mainly on interpreters' oral interpreter language skills, bilingual speaking skills, adaptability techniques and interactive skills to convert a language into another language and to restore the original meaning as much as possible. Among the key intermediate links is the working memory, its formation in addition to the translator's schema cross-cultural communication skills are closely related to the most important thing is that it and emotional emotions (anxiety control) interaction. The emotional emotion (anxiety control) also runs through the entire interpretation process, the translator is not familiar with the original accent, the ability of their self-confidence and so may lead to their own anxiety, which has an important impact on the quality of interpretation.

Research Methods and Processes

Hypothesis. According to the theory of emotional resource allocation, the inducement of any kind of emotional state will improve the independent thinking of the individual during the execution of the task, and these unrelated thinking will reduce the attention assigned to the memory task, thus reducing the task performance (Ellis H C, 1988). So the low performance of interpretation is not only caused by working memory, it may be caused by these irrelevant thinking. Anxiety is a typical problem of emotional factors that affect the quality of interpretation. Anxiety is one of the emotional states, and many interpreters are present in a state of mind before the scene. Interpreting anxiety is more prevalent among student translators and professional translators. Based on this important reason, Kang Zhifeng proposed the level of interpretation anxiety. Domestic, Kang Zhifeng (2011) that anxiety can be divided into "extraterritorial factors" and "internal factors". Kang Zhifeng (2011) analysis of beginners in the interpretation of college students and have a certain interpretation of experience but not much contact with the interpreter, draw the conclusion: 1) high anxiety seriously affect the individual's memory process, so that the information storage system disorders. 2) It is generally believed that low anxiety does not seem to have a serious impact on interpretation. In fact, low anxiety students may be in a cold or indifferent state, the formation of indifferent state. Intermediate level interpretation anxiety has no negative effect on the completion

of the interpreting task, but rather it plays a catalytic role because appropriate anxiety can activate brain cells in the control language region. (Kang Zhifeng, 2012: 106-109; 2013: 76-81). Based on the above theory and research results, this study suggests that interpreting anxiety has a greater impact on the quality of interpretation than working memory.

Subjects. The subjects of the study were Southwest University for Nationalities, Sichuan Foreign Studies University Chengdu College, Three Gorges University 102 English students. All subjects were native English learners, their unclear vision or corrected visual acuity normal, right hand, no color blindness. In view of this study to examine the effect of the breadth of working memory on the quality of interpretation anxiety, it is necessary to distinguish the level of work memory. We used the Memory Memory Questionnaire to test the level of memory for all subjects to screen out the official subjects that were appropriate for the study. Eighteen subjects who were tested with incomplete or inadequate data were screened for the remaining 84 subjects. The test scores with low working memory scores were 57.67, and the test scores with high job memory scores were divided into 67.00. The results of single factor analysis showed that there were significant differences (P = .000) between the two groups.

Experimental Materials and Steps. Experimental materials for the working memory span test papers, "interpretation anxiety scale", interpretation test papers each one. Interpreting anxiety measurement method for the questionnaire survey, using Dong Yanping prepared "interpretation anxiety scale". Questionnaires and tests were conducted by teachers in the classroom. Before the start of the questionnaire, inform the official test subjects need to complete a test. The test needs to be done independently within the specified time. After the questionnaire and the test were completed, the effective data were analyzed and analyzed by SPSS17.0.

Data Collection and Analysis. We analyzed the scores of the 60 valid questionnaires by one-way ANOVA. The results show that there is significant difference between the interpretation anxiety score and the low working memory span (see Table 2), and the level of job memory will undoubtedly have a significant effect on the interpretation anxiety (P = .000). Descriptive statistical analysis results also show that the anxiety scores (62.93) of the low working memory span subjects were significantly higher than those of the anxiety scores (57.00) of the high working memory span subjects (Table 1).

Table 1. Different Memory Levels Tested Interpreting Anxiety Score Descriptive Statistical Analysis Results

Subject Memory Level	Number of Subjects	Anxiety Average Score	Standard Deviation
Low level	30	62.93	6.13
High level	30	57.00	5.88

Table 2. Different memory levels Tested Interpreting Anxiety scores Single factor analysis of variance

	Degrees of Freedom	Mean Square	The Value of F	The Value of P
Between Groups	1	528.07	14.63	.000***
Within Group	58	36.10		

Note: ***$P \leq 0.001$

To further determine the effect of the breadth of working memory on interpretation anxiety, we analyzed the variance of the test scores of the two groups (see Table 3 and Table 4) to confirm the previous hypothesis, ie, the subjects with low scores Interpreting anxiety scores will be higher, whereas the interpretation anxiety scores are correspondingly lower.

Table 3. Different Memory Levels Tested Interpretation Test scores Descriptive statistical analysis results

Subject Memory Level	Number of Subjects	Test Average Score	Standard Deviation
Low level	30	53.17	7.48
High level	30	60.90	5.53

Table 4. Results of single-factor analysis of variance at different memory levels

	Degrees of Freedom	Mean Square	The Value of F	The Value of P
Between Groups	1	897.07	20.72	.000***
Within Group	58	43.29		

Note: ***$P \leq 0.001$

It can be seen from Table 3 that the scores of the test scores between the two groups of subjects with different levels of memory are different, and the interpretation test scores (53.17) of the low working memory span are significantly lower than the interpreting scores of the high working memory span (60.90). The results of single factor variance further show that there are significant differences in the scores of interpreting test between the two groups, which indicates that the working memory span has a significant effect on the test scores. Based on the above research results, it is not difficult to find that the low working memory span is high in interpreting anxiety and low in the interpretation test scores. The high job memory span is low in interpreting anxiety and high in interpreting test scores.

The Discussion of the Results

The Study Results and Its Theoretical Significance. The results of this study show that interpreting scores are more affected by interpretation anxiety in different working memory levels and different levels of interpreting anxiety. Interpreting anxiety seriously hinders the play of working memory. An analysis of the factors that affect interpretation anxiety suggests that the most influential factor in interpreting anxiety is the difficulty of interpreting tasks. We should not consider the relationship between interpreting anxiety, working memory and the quality of interpreting with simple linear thinking. We should also pay attention to the various factors that affect these three variables. In foreign language teaching and interpreting, we should focus on cultivating the interpreting literacy of students and interpreters to reduce their interpretation of anxiety, in order to enable them to better play their own working memory advantage, but also pay attention to the interpretation of students and interpreters level, select the appropriate training materials, the design step by step training steps.

The Limitations and Prospects of Research. Although this study has received some valuable results, but the study is still inadequate, should be further improved and research. First of all, the study subjects are from colleges and universities, colleges and universities of the interpretation of the environment, interpreting tasks and interpreters in which the environment is quite different. Secondly, although the study studied the effects of interpretation anxiety and working memory on the quality of interpretation, many factors that may affect the quality of interpretation are not involved. In addition, working memory and interpretation anxiety are variables that are influenced by multiple factors, individual psychological factors, environmental factors, cultural factors and individual factors are often very large and difficult to control. In this study, the use of college

students as a sample, although to some extent control the background differences, but at the same time brings another problem, that is, the study has a very obvious environmental characteristics, the difference between groups is small, which also led to the conclusions the ecological validity of the constraints. Future studies should incorporate more variables into the study through larger sample studies to obtain more generally adaptive research conclusions.

Conclusion

Through the analysis of the depth of the data, we finally found that the quality of interpretation was more affected by interpretation anxiety in different working memory levels and different levels of interpreting anxiety. This has a significant reference for improving the teaching methods of interpreting and improving the quality of interpreters. For example, we should use some effective ways to reduce the level of anxiety of interpreters (such as student translators) and thus enhance their working memory. The way to reduce the level of anxiety of an interpreter is also a place that we need to pay attention to in the future. In short, the role of interpretation anxiety and working memory on the quality of interpretation is still relatively small, this is a new attempt, both for interpretation teaching or interpretation test have a certain reference value.

In addition to working memory and interpretation anxiety dimensions, other dimensions are important such as listening comprehension, cross-cultural communication, interpreting language skills, interpreting norms, and so on. We will also conduct an in-depth and systematic study of how many factors are involved in the interface of the interpretation capacity structure and how they relate to each other.

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