



CORRELATION ANALYSIS BETWEEN VERBAL INTELLIGENCE AND CHINESE RELATIVE CLAUSE PROCESSING

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Abstract

The processing of relative clauses is influenced by many factors such as the complexity of syntax, and one's working memory load and so on. This research makes a correlation analysis with an aim to discover the correlation between verbal intelligence and processing of Chinese relative clauses. The verbal intelligence test is conducted by the verbal scale of the Wechsler Adult Intelligence Scale. 96 stimuli sentences are used in the behavioral experiment of processing Chinese relative clauses.

The experiment results showed a significant correlation between verbal intelligence and the processing of Chinese relative clauses, which indicates that both reaction time and accuracy of the processing of Chinese relative clauses are correlated with verbal intelligence quotient (VIQ).

The findings of the experiment confirm the significant role of verbal intelligence levels that play in Chinese relative clause processing and the correlation between them.

Key Words: verbal; intelligence; Chinese relative clause.

Introduction

Relative clause is an important sentence construction that has gained great attentions among language researchers in the field of linguistics and psycholinguistics and so on. Relative clause processing is a very complex process, which involves the relevant linguistic knowledge and non-verbal knowledge as well as one's cognitive abilities. Researchers have put forward a series of theories and hypothesis about the factors that influence sentence processing, like working memory load and perspective shifting and so on. They agree that the processing of a sentence actually is an interaction of various factors.

Many researches on the processing of relative clauses are from syntactic level. And there are also a large number of studies concentrate on the perspective of semantics and high technologies are also used to investigate the processing of relative clauses, like ERP^[1] and eye-tracker^[2]. But little evidence has been found to carry on a correlation analysis and combine verbal intelligence with processing of relative clauses, so this research will demonstrate a correlation analysis with the aim to investigate the correlation between verbal intelligence and the processing of Chinese relative clause.

Two experiments will be carried out in this research. The first experiment is the verbal intelligence test of all the participants and the verbal scale of Wechsler Adult Intelligence Scale is used to conduct the experiment. The second experiment is about the processing of Chinese relative clause processing, in which 48 subject relative clause, 48 object relative clauses, and 80 fillers are used as stimuli sentences.

This research first gives a literature review of intelligence definitions and some influential intelligence theories, and then is a review of the processing of relative clauses. The second part is an introduction of the two experiments. The third part presents the experiment results. Part four is a general discussion on the results of the experiment and gives some analysis to explain the results. And conclusions will be drawn in part five on the correlations between verbal intelligence and the processing of Chinese relative clauses.

1. Review on Intelligence and the Processing of Relative Clauses

1.1 The Definition of Intelligence

In terms of the definition of verbal intelligence, there is no clear concept to define it, but the arguments on the definition of intelligence had ever been a hot topic among researchers. So the thinking carding of what is intelligence is very necessary. What is more, this research needs to rely on a theoretical basis for the choice of intelligence scale used to measure verbal intelligence. From the above reasons, the definitions of intelligence are combed as follows.

Psychologists held their own opinions which varied in focuses. Generally they can be grouped into the following:

(1) Intelligence is the ability to adapt to the environment: American psychologist Thorndike holds that intelligence is the response capacity to adaption. Swiss psychologist Piaget believed that the essence of intelligence is adaption and achieving a new balance between individual and the environment and this is realized by individual's actions and operation ability. In a word, people who hold this opinion believe that, the higher the ability of human intelligence is, the stronger the ability to adapt to the environment.

(2) Intelligence is the ability of abstract thinking: this view holds that intelligence should include all senior mental processes, and mainly the reasoning, the judgment and using experience to solve new problems. American psychologist Terman thinks that an individual's level of intelligence is in direct proportion to one's ability of abstract thinking. In short, this theory holds that intelligence is the ability of abstract thinking and abstract thinking capabilities include the ability of judgment, comprehension, reasoning, creativity and other capabilities. So, the higher level of human intelligence, the stronger the ability of abstract thinking.

(3) Intelligence is the ability of learning: this view holds that that intelligence is the ability to learn and the ability to acquire knowledge. In short, this view believes that there is a moderate positive correlation between the level of intelligence and their academic achievements which indicate that the level of intelligence can be judged from their ability of learning.

In 1986, Robert Sternberg and Douglas Detterman collected and collated the materials of psychologists' understandings of the nature of intelligence and published *what is intelligence: Contemporary view point on its natural and definition* [3]. In this book, Sternberg shows affirmation to the previous discussion on the nature of intelligence and meanwhile he thinks that this discussion broadened the understanding of what intelligence is. For example, Anastasi admits that intelligence meets the requirements of a changing environment with an adaptive and effective way; and he also proposed that the adaptive behaviors vary from populations to situations. Brown and Campione emphasize the relationship between intelligence and efficiency of learning and he also proposed metacognition and interaction of knowledge and learning.

Compared the discussions on the nature of intelligence, we can notice that it emphasizes the culture property of intelligence and holds the view that the understanding of intelligence can not be separated with one's cultural background. It emphasized the social and practical properties of intelligence. Researching on intelligence in social situations and in practice, and doing research in the laboratory situations are of the same significance. It proposed metacognitive component of intelligence. "Metacognition" was proposed by American developmental psychologist, Flavell. He believes that metacognition is a kind of cognitive activity or knowledge which can reflect and regulate any aspect of one's cognitive activities. He also proposed three components of metacognition, which includes metacognitive knowledge, metacognitive experience and metacognitive monitoring. It proposed the theory of multiple intelligences [4] [5]. Harvard University psychologist H. Gardner proposed multiple intelligence theory and published *Frame of Mind* [6] in 1985, which expounds this theory in details. In his book, H. Gardner proposed that there exist 7 kinds of relatively independent intelligences in the multiple intelligence frameworks, namely: verbal-linguistic intelligence, musical-rhythmic intelligence, logical-mathematical intelligence, visual-spatial intelligence, bodily-kinesthetic intelligence, self-questioning intelligence and interpersonal intelligence.

Through the various perspectives on the definition of intelligence, we can find that although psychologists' views vary from person to person, they all admit that intelligence is not composed by a single factor, but by complex interrelated forces with their own emphasis, and some psychologists also put up with the concept of verbal-linguistic intelligence, like Gardner. According to the different intellectual focuses, psychologists have developed different intelligence scales with different focuses which has provided significant research values on intelligence. Like the Wechsler Adult Intelligence Scale is formed by verbal intelligence scale and performance intelligence scale.

1.2 Intelligence Theories

1.2.1 The Two Factor Theory of Intelligence

The intelligence factor theories are concerned with what factors constitute intelligence. Mainly there are three theories about intelligence factors: Spearman's two-factor theory [7], Thurston's group - factor theories [8] and Cartel's fluid and crystallized intelligence theories [9].

The two-factor theory of intelligence holds that intelligence is composed by general factor (G factor) and special factor (S factor). G factor represents one's general ability and it is the basis of our intelligence activities. The

requirements for some unique factors, Spearman called such factors special factors (S factor). Spearman imagined G factor as a mental ability, and any intellectual activity was driven by the G factor, when this ability entered specific nerve group, resulting a specific intelligence operation, that S factor worked. The same person, at the completion of different activities, G is a common factor, but S factor varies from tasks.

1.2.2. Group - factor Theory of Intelligence

American psychologist Thurstone proposed group -factor theory of intelligence in 1938. He holds that intelligence is composed by seven basic capabilities and they are:

1. Verbal ability: the ability of understanding the meanings of words;
2. Digital capability: the ability of rapid and correct processing of digits;
3. Spatial ability: the ability of right judgment of position and direction;
4. Perceptual speed: the ability of fast and accurate grasps the details, and distinguishes similarities and differences;
5. Word fluency: the ability to quickly tell as many synonyms as you can within a certain time;
6. Mechanical memory ability: the ability to quickly and correctly remember all materials;
7. Inductive reasoning ability: the ability to discover the rules of the material in a group, the ability of inductive reasoning.

Thurstone applied multivariate analysis and created multi-factor theory of intelligence, and enabled the researches from the attention to the existence of G factor to the further analysis of intelligence factors, and there have been some Intelligence Structure Models.

1.2.3. Liquid and Crystallized Theories of Intelligence

American psychologist R.B Cattell created liquid and crystallized theories of intelligence on the basis on Spearman's two-factor theory in 1963. He conducted further analysis of Spearman's g factor by factor analysis, and he thought that g factor is composed by two parts, one is the fluid intelligence, expressed by gf; another is crystallized intelligence, expressed by gc.

Liquid intelligence is on the basis of neurophysiology, improved with the maturity of the nervous system, and weakened as the nervous system becomes falling into a decline, relatively unaffected by education and culture. Such as mechanical memory, this memory will be enhanced with the nervous system becomes mature, and weakened with the decline of the nervous system, and less dependent on the individual's education and culture. In addition to mechanical memory, reaction speed also belongs to fluid intelligence.

Crystallized intelligence is based on acquired experience, and it is the ability of solving problems through learning and obtained knowledge. Such as vocabulary, verbal comprehension and mathematical knowledge which all belong to crystallized intelligence. The development of crystallized intelligence is based on liquid intelligence. If a person has a high level of fluid intelligence, then he is likely to develop a strong ability of crystallized intelligence.

The two kinds of intelligence vary with the age of the individual. At the beginning, the development trend of the two kinds of intelligence is consistent, both increases with age. When the individual reaches 25 years old, the development trend of the two kinds of intelligence begins different, fluid intelligence becomes to experience recession phenomenon, and crystallized intelligence is still growing which can continue until one's old age, but the growth rate is not as fast as his childhood.

1.2.4 Gardner's Multiple Theory

American psychologist of Harvard University, Gardner proposed the theory of multiple intelligences in 1983. In his book, *Frames of Mind*, he proposed that there exist seven independent intelligences, and they relatively are: verbal-linguistic intelligence, musical-rhythmic intelligence, logical-mathematical intelligence, visual-spatial intelligence, bodily-kinesthetic intelligence, intrapersonal intelligence and interpersonal intelligence. In 1998, Gardner proposed natural intelligence, the ability of identifying nature. The typical example is Darwin.

Gardner thinks that these kinds of intelligences are independent from each other. And different combinations of these intelligences and the different performances of each intelligence of individual, they together reflect the differences in intelligence between individuals.

The Wechsler Adult Intelligence Scale has been found to be a good measure of both fluid and crystallized

intelligence. In the WAIS, fluid intelligence is reflected in the performance subtests. Crystallized intelligence is reflected in the verbal subtests, which is used in this research.

1.3 Theories on Processing Relative Clauses

1.3.1 Active Filler Strategy

The Active Filler Strategy was first proposed by Frazier (1987)^[10]. It is from the syntactic complexity point of view to explore the differences between subject and object relative clauses. According to the transformational linguistic theories, the relative pronoun of the subject relative clause is from the subject position and then is moved to the clause-initial position. The relative pronoun of the object relative clause is from the object position and is also moved to clause-initial position.

The active filler strategy indicates that when the reader encounters filler, the earliest possible gap position it is assigned to is the subject position in relative clause. Actually, this strategy makes sense for subject relative clauses, but in object relative clauses it is problematic, because the subject position is occupied. Thus, the theory proposes that this will lead the reader to choosing analyzing the relative pronoun of the relative clause immediately. The active filler strategy is on the basis of the syntactic structure of the relative clause without considering the semantic information as an influencing factor of processing of relative clauses.

1.3.2 Unrestricted Race Model

The unrestricted race model is proposed by Traxler, et al. (1998)^[11]. It holds that the choice of the parser is variable which is different from the active filler theory. If alternative syntactic structures are ambiguous, they will be computed in parallel. And which will be adopted is according to the construction speed. The one that is constructed fastest will be adopted by the parser. Sometimes a reanalysis has to take place because the other possible structures are dropped, and subsequent information is inconsistent with the analysis that is adopted. In terms of subject and object relative clauses, it means that the parser sometimes analyses the relative clause as a subject relative clause, but in some other cases as an object relative clause. The difference between them can lead to the fact that the subject relative clause wins the race more often, because the subject relative clause is easier to compute than the object relative clause.

1.3.3 Syntactic Prediction Locality Theory and Memory-based Accounts

The syntactic locality theory is proposed by Gibson (1998)^[12]. It holds that readers choose to analyze the relative pronoun of the relative clause immediately. The syntactic prediction locality theory claims that readers' analysis on the relative clause is on the basis of the memory load. Based on the syntactic prediction locality theory, to complete the current input string as a grammatical sentence, you need to remember each constituent that is required and this process requires a cost associated with remembering each constituent. The number of required constituents between subject and object relative clauses is different when the reader encounters a relative pronoun. To complete a subject relative clause, readers need to remember two constituents: a subject NP-trace and a verb. But for an object relative clause, readers need to remember three constituents: a subject NP, an object NP-trace and a verb.

From the syntactic prediction locality theory, we can find that memory load is a necessary factor that influences the processing of relative clause. Memory-based accounts claim that the processing difficulty between a subject relative clause and an object relative clause is different. And processing an object-extracted relative clause can increase one's working memory demands (e.g., Frazier&Fodor, 1978^[13]; Ford, 1983^[14]; Maewhinney, 1987^[15]).

1.3.4 Constraint-based Models and Semantic Factors

Many researchers give their attention to the effects of syntactic complexity, memory load and etc, and others try to explain the processing of relative clauses from the semantic point of view. There are many semantic factors related to relative clause processing, like the definiteness and animacy of the nouns. And among all the semantic factors, animacy is regarded as a very important one that influences relative clause processing.

Constraint-based models hold that at the earliest stage of processing relative clauses, there is no syntactic information (e.g., Trueswell, Tanenhaus & Garnsey, 1994^[16]). The first choice between alternative constructions is not influenced by syntactic information in the models. Trueswell did an experiment and in his experiment, he uses animacy to test the readers' performance of processing relative clauses in different situations. His sentences can be divided into

two types: one is that the sentence-initial noun phrase and the verb that followed are consistent and another type is inconsistent. He finds that readers are sensitive to the semantic inappropriateness of the noun which functions as the subject of the verb and readers use this information to choose the correct parse of the sentence. He draws a conclusion that semantic factors can override syntactic processing biases.

2. Methodology

This part will introduce the two experiments, the verbal intelligence test and the behavioral experiment of Chinese relative clause processing, including subjects, materials, procedure, data collection and analysis.

2.1 Subjects

Fifty students from Dalian University of Technology, 25 from arts majors, another 25 from science and engineering majors participated in the experiment. Their age is between 22-28 (average: 24.64; std. deviation: 1.258) All the subjects are right-handed, native Chinese speakers, with normal or corrected to normal vision, and no neurological disorder or major head injury. They all volunteered to participate and agreed to cooperate in the process. They all got paid for their participation.

2.2 Materials

2.2.1 The Measurement of Verbal Intelligence - Wechsler Adult Intelligence Scale

In the verbal intelligence test, the Wechsler Adult Intelligence Scale is used to test all the subjects' verbal intelligence. This intelligence scale is a comprehensive intelligence test and it is also the mostly widely used tool to measure intelligence in the world nowadays.

Wechsler Adult Intelligence Scale is divided into two subscales: verbal scale and performance scale, six subtests in verbal scale and five subtests in performance scale, with a total of 11 subtests. The names of the subtests in the two scales are listed in table 2.1. This research just adopted the verbal scale, the former six subtests.

Table 2.1 the 11 subtests of Wais

Verbal scale	Performance scale
1.information	7.digit symbol
2.comprehension	8.picture completion
3.arithmetic	9.block design
4.similarities	10.picture arrangement
5.digit span	11.object assembly
6.vocabulary	

The subtests of the verbal scale can measure different abilities of the subjects, Generally speaking, subtests digit span and arithmetic can reflect the subjects' faculties of memory. Information, comprehension, similarities and vocabulary can reflect one's verbal comprehension abilities.

2.2.2 Chinese Relative Clauses

Twenty-four sets of experimental sentences, each set four relative clauses, with a total number of ninety-six relative clauses, forty-eight subject relative clauses and forty-eight object relative clauses were adopted in the experiment. The relative clauses with in the same set remain the same length and the same words, but different orders. Besides the relative clauses, another eighty non-restrictive sentences were added as fillers and appear randomly during the experiment.

2.3 Procedures

2.3.1 Verbal Intelligence Test

The subjects seated in front of the experimenter, and the experimenter read every test items to the subjects and provided guidance and instructions when it was necessary. Meanwhile the experimenter was in charge of recording the subjects' performance and sometimes some positive encouragement was also in need.

(1) Information test: in this part, the experimenter read the testing items and the subjects answered the questions. This subtest includes common sense of history, astronomy, geography, literature, and other aspects of nature. According to this test, you can measure the subjects' breadth of knowledge and interest. Wechsler believes that the higher your

intelligence is, the broad will be your interest; the stronger is your curiosity, the more knowledge will be gained. At the same time the test can also reflect the subjects' status of long-term memories.

(2) Comprehension test: in this test subjects were provided some hypothetical situations, and were asked to give solutions. According to this test, it can measure the subjects' actual problem solving abilities, adaptabilities and organizing information abilities.

(3) Arithmetic test: in this test subjects were asked to do some calculations without pen and paper, only mental calculation. This test can measure the subjects' basic mathematical knowledge and mathematical thinking ability.

(4) Similarity test: The test subjects were asked to summarize the commonalities between two objects, such as: what are the similarities between tables and chairs? What are the similarities between trees and flies? This test can measure the ability to generalize and the ability of abstract thinking.

(5) Digit span test: The experimenter read 2-9 random numbers and subjects were asked to recite along or backwards respectively. The total score is made up by the two fractions. This test can measure the subjects' attention and transient memory ability.

(6) Vocabulary test: in this test subjects received some words one by one and were asked to explain the general meaning of every word. For example: what's the meaning of "beautiful"? This test can measure the comprehension ability and the ability of expressing the meaning of words; at the same time the subjects' ability of abstraction can also be measured.

2.3.2 The Processing of Chinese Relative Clauses

In this experiment, subjects seated in front of the computer with a distance about fifty cm to the center of the screen. And they kept their fingers resting on the space bar and the keys of "F" and "J". Subjects read the experimental sentences on the computer screen. Before the formal experiment, some instructions about the experiment were displayed to explain the content and procedures of the experiment to the subjects.

Then there was a short practice block presented to get the subjects familiar with the experiment. The experimental trials were controlled by Linger. Subjects could see 1 or 2 rows of dashes, and the dashes were covering the words in the sentence. When the space bar was pressed, the first word would appear. With every press of the space bar, a new word would appear and the last word would become dashes again. The subjects tried to read the sentences as naturally as possible and understand the content. When they finished reading the last word, pressed the space bar again. The dashes went away and they saw a question about the sentence they just read. To answer the question, subjects pressed "F" for YES and "J" for NO. They tried to answer as quickly and accurately as possible. After the question, the computer automatically went on to the next sentence. Subjects could take breaks when they needed, and they were allowed to do so before started reading a new item. When the experiment was over, the screen appeared telling the subjects to stop.

The ninety six experimental sentences and eighty filler sentences were pseudo-randomly arranged to make sure that all the experiment sentences were separated by at least one filler sentence. The entire experiment lasted for about half an hour.

2.4 Data Collection

For the intelligence data, the scores of verbal intelligence were collected (VIQ). Besides their overall performance, the subjects' performance in each subtest of the verbal scale was collected. The Nuo He Wais intelligence software V8.0 recorded the verbal intelligence data.

For the Chinese relative clause processing, the reaction time was collected and accuracy was calculated. The software Linger recorded all the subjects' performance in this behavioral experiment.

2.5 Data Analysis

The tool SPSS, Chinese version 17.0 was used to analyze the experimental data, the correlation analysis between verbal intelligence and processing of Chinese relative clauses. From a holistic point of view, two levels of analyses were made, the correlation between RT and VIQ, accuracy and VIQ.

3. Results

3.1 Verbal Intelligence test results

According to Wechsler, intelligence can be divided into seven altitudes: very extraordinary, extraordinary, and higher than usual, usual, and lower than usual, boarder and intellectual deficiency. The results of the subjects in the verbal intelligence test occupy three altitudes from higher than usual to very extraordinary, as showed in table 3.1.

Table 3.1 distribution of verbal intelligence test altitudes

verbal intelligence test results	
Very extraordinary ≥ 130	1
Extraordinary 120~129	25
Higher than usual 110~119	24

Table 3.1 shows the results of the verbal intelligence test. The subjects performed well in the test that all of them are above the usual level and 25 belongs to the extraordinary level which indicates that 50% of the subjects belong to extraordinary level.

3.2 Results of Chinese relative clause processing

The reaction time and accuracy of the stimuli sentences were analyzed. The average reaction time for all the stimuli sentences was 1185ms, and the average accuracy was 91%. The results of this experiment, especially the value of accuracy could demonstrate that all the subjects had focused their attentions during the experiment and they could understand the stimuli sentences well, which guaranteed the experiment results plausible.

3.3 Correlation between verbal intelligence and the processing of Chinese relative clause

Table 3.2 correlation between RT and VIQ

		RT	VIQ
Spearman's rho	RT	Correlation Coefficient	1.000
		Sig.(2-tailed)	.012
		N	50
	VIQ	Correlation Coefficient	-.352*
		Sig.(2-tailed)	.012
		N	50

* Correlation is significant at the 0.05 level (2-tailed).

The experiment results showed that there is a significant correlation between verbal intelligence and the reaction time of the processing of Chinese relative clauses. For the correlation between RT and VIQ, as showed in table 3.2, the significance value $p=0.012 < 0.05$, which indicates that the result is statistically significant. The correlation coefficient is -0.352 with one asterisk, which indicates the correlation between RT and VIQ, is significant and they are correlated with each other.

The results of the correlation between accuracy of Chinese relative clauses and VIQ are showed in table 3.3.

Table 3.3 correlation between accuracy and VIQ

		accuracy	VIQ
Spearman's rho	accuracy	Correlation Coefficient	1.000
		Sig.(2-tailed)	.004
		N	50
	VIQ	Correlation Coefficient	.401**
		Sig.(2-tailed)	.004
		N	50

** Correlation is significant at the 0.01 level (2-tailed).

The experiment results showed that for the correlation between accuracy and VIQ, the significance value $p=0.004 < 0.01$. It means that this result is statistically significant. And the correlation coefficient is 0.401 with two asterisks, which represents that the correlation between accuracy and VIQ is highly significant and there is a stronger correlation between them than that between RT and VIQ.

4. Discussion

The results of the experiment suggest that there is correlation between verbal intelligence and the processing of

Chinese relative clauses, which indicates that those who achieve high scores in the verbal intelligence test tend to perform better in the experiment of Chinese relative clause processing than those who achieve relatively low scores in the verbal intelligence test. The factors that formed the overall verbal intelligence have overlaps with the intelligence factors that involved in relative clause processing. Essentially speaking, the areas that determine one’s verbal intelligence in human’s brain have overlaps with the areas that participate in relative clause processing.

In terms of the constitutions of verbal intelligence, the widely discussions on the definition of intelligence have come to the conclusion that intelligence is not constituted by one factor, but it is formed by multiple factors, like Thurstone’s group factor theory and Gardner’s theory of multiple intelligences, which includes verbal-linguistic intelligence, musical-rhythmic intelligence, logical-mathematical intelligence, visual-spatial intelligence, bodily-kinesthetic intelligence, self-questioning intelligence and interpersonal intelligence. Obviously, the verbal-linguistic intelligence is an inevitable part of the full intelligence and it is an essential cognitive ability that is required in language processing. That’s why the two variables that we measured, both RT and accuracy of the processing of Chinese relative are all correlated with VIQ.

RT is correlated with information and digit span, and accuracy is correlated with comprehension of the verbal scale, as showed in table 4.1 and 4.2. The subtest of information can measure the subjects' breadth of knowledge and interest. At the same time the test can also reflect the subjects’ status of long-term memories. Imagine that if one who is fond of reading, and he or she cultivates the habit of reading, what would happen? He or she reads a lot, and naturally they would improve the efficiency of reading. For example, at the beginning, they can read five words within one second, and after a lot of reading practice, they may read eight words within one second. Sometimes, wide knowledge means high efficiency, and it can be applied to relative clause processing, especially the RT, which can reflect one’s efficiency of language input. So, the more efficient input of Chinese relative clause can lead to short response time.

The digit span can measure the subjects’ attention and transient memory abilities. Good transient memory can make sure the subjects can recite the numbers accurately. And working memory load has been proved to be a significant factor that influences the processing of relative clauses. The subject who possesses good attention and transient memory abilities can have excellent performance in the subtest digit span, and likewise, the good capacities that required in Chinese relative clause processing can directly lead to short time used in response to the stimuli.

Table 4.1 correlation between information and RT

			RT	information
Spearman’s rho	RT	Correlation Coefficient	1.000	-.315*
		Sig.(2-tailed)	.	.026
		N	50	50
	information	Correlation Coefficient	-.315*	1.000
		Sig.(2-tailed)	.026	.
		N	50	50

*Correlation is significant at the 0.05 level (2-tailed).

Table4.2 correlation between digit span and RT

			RT	digit span
Spearman’s rho	RT	Correlation Coefficient	1.000	-.412**
		Sig.(2-tailed)	.	.003
		N	50	50
	digit span	Correlation Coefficient	-.412**	1.000
		Sig.(2-tailed)	.003	.
		N	50	50

** Correlation is significant at the 0.01 level (2-tailed).

Accuracy is correlated with the subtest, comprehension, as showed in table 4.3. Comprehension test belongs to the scope of verbal comprehension. The performances of the subjects could be judged from their answers, whether they possess good organizing information abilities or not. The good grasp of organizing information ability indicates their good thinking and high level of understanding verbal information, therefore when they input the stimuli, they can relatively give accurate responses, which can influence the accuracy of the experiment.

Table 4.3 correlation between comprehension and accuracy

			accuracy	comprehension
Spearman's rho	accuracy	Correlation Coefficient	1.000	.287*
		Sig.(2-tailed)	.	.043
		N	50	50
	comprehension	Correlation Coefficient	.287*	1.000
		Sig.(2-tailed)	.043	.
		N	50	50

* Correlation is significant at the 0.05 level (2-tailed).

According to Cohen and Parker's factor analysis of WAIS, information and comprehension belong to V.C (verbal comprehension), digit span belong to memory, freedom from distractibility. From their factor analysis, we can find that the relevant three subtests, information, comprehension, digit span involve verbal comprehension ability and memory, distractibility, and these abilities are what Chinese relative clause processing involves. The processing of Chinese relative clause is.

Conclusion

In this research, RT of the processing of Chinese relative clauses is correlated to verbal intelligence. Accuracy of the processing of Chinese relative clauses is also correlated with verbal intelligence. Compared with RT, the correlation coefficient between accuracy and VIQ is bigger than that of RT and VIQ ($|-0.401| > |-0.352|$), which indicates that the correlation between accuracy of Chinese relative clause processing is stronger than that between RT and VIQ.

From the experimental results, processing of Chinese relative clause is correlated with verbal intelligence. During the process of Chinese relative clause processing, subjects tend to be influenced by the capabilities of verbal comprehension, memory, and distractibility most which can be reflected through the subtests, information, comprehension, and digit span of the verbal scale.

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