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Mingyu ZHANG[1]

Abstract

Language teaching cannot be separated from cultural factors. Foreign language communication is cross-cultural communication, which has some relations with linguistic ability. As one of the important components of linguistic aptitude, grammatical sensitivity issues play an important role in the second language acquisition and English teaching. Through the exploration of Carroll's MLAT, we independently designed a set of test questions. The purpose of this study is to study the grammatical sensitivity of linguistic aptitudes and to provide theoretical support for foreign language learning and college English teaching. Our research has found that grammatical sensitivity has a significant impact on their cross-cultural communication and language learning activities among foreign-language learners who are native speakers of Chinese. After research, we can say that the means of making words, extending sentences and reading paragraphs can effectively test the grammatical sensitivity of Chinese learners. Finally, grammatical sensitivity can truly affect the outcome of language learning. However, due to the different grammar of each language, Chinese grammatical sensitivity cannot be used as an indicator to test foreign language aptitude in Chinese-speaking learners.

Keywords: intercultural communication, linguistic aptitude, grammatical sensitivity, test indexes, intercultural communication, social environment.

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Introduction

In the context of globalization, people need to have a certain degree of language skills and intercultural communication ability. Though Chinese students have strong and good language skills, their social and intercultural communication skills are poor. College English teaching is a typical example. The current language teaching aimed at training foreign language talents is entering a new phase. This phase takes language and culture as input to develop students' social and intercultural communicative competence. Nowadays, language teaching experts recognize that language teaching cannot be separated from cultural factors, and foreign language communication is cross-cultural communication (Akhondi *et al.*, 2015). Whether they have the ability of cultural cognition and intercultural communication is an important criterion to measure modern foreign language talents. According to the theory of the relationship between language and culture, language is one of the main lines of all cultures. The core culture of intercultural communication is also buried in the language, so intercultural communication and linguistics cannot be unrelated (Suzuki, Oishi, & Ogawa, 2019). And linguistic ability is a relatively stable ability that people will show when they learn a second language. Its influence on the second language learning has aroused widespread concern of many foreign scholars. In the field of second language acquisition, linguistics has become an important exploration point. Until now, linguistics has been considered as the most important factor that can predict the level of foreign language learning (Booth, 2014). On the one hand, the problem of grammatical sensitivity is one of the important components of linguistic aptitude. On the other hand, it is not only a language inductive learning ability but also an ability to deduce linguistic forms, rules and forms from linguistic materials. It plays an important role in second language acquisition and English teaching (Laukka *et al.,* 2016). Therefore, the study of the relevance of grammatical sensitivity test indicators becomes very important in the context of intercultural communication. It is not only helpful for the reform and development of college English teaching in our country, but also important for the second foreign language learners to improve their learning methods.

Literature Review

In the context of globalization, people from different cultural backgrounds have the precondition for effective communication. In addition to learning a good foreign language, you must know foreign cultures and familiarize the differences between cultures. You must have the necessary language skills and intercultural communication skills (Kim, Choi, & Tatar, 2017). The foreign language teaching in China has undergone a series of reforms, but the teaching effect has always been unsatisfactory. The students have strong and good language skills. But their

social and intercultural communication skills are poor. College English teaching is a typical example.

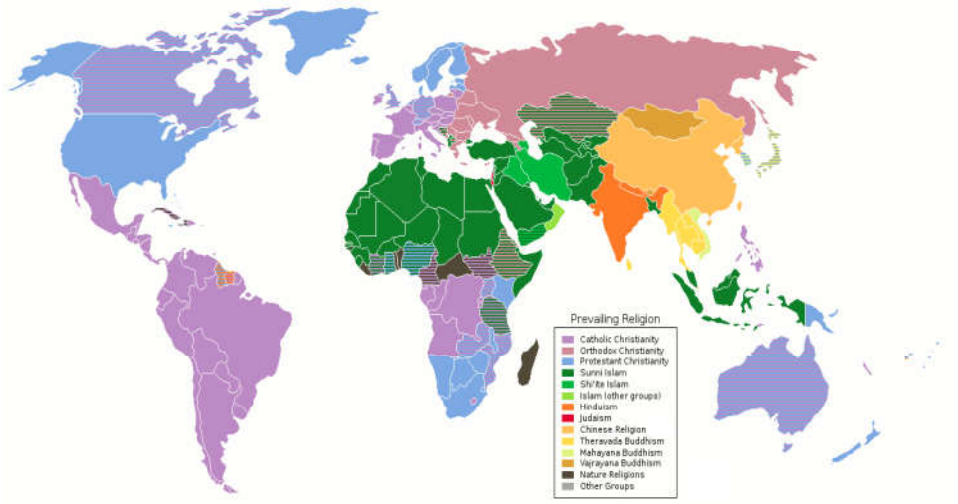

Figure 1. World map of cultural distribution

Cross-cultural communication research rose in the fifties of last century. Based on the research results of anthropology, psychology, linguistics, communication, sociology, philosophy and culture, many scholars have constructed unique theoretical frameworks and research methods for intercultural communication. American anthropologist Edward Hall has studied the relationship between culture and communication. He is called "Father of Intercultural Communication" and his book "Silent Speech" is regarded as the foundation of intercultural communication research (Schwieter, Jackson, & Ferreira, 2018). Intercultural Communication Theory: Current Perspectives is considered as a hallmark of an independent and mature discipline. Intercultural communication makes language teaching experts recognize that language teaching cannot be separated from cultural factors. Foreign language communication is intercultural communication. An important criterion for measuring foreign language talents is to see whether they have the ability of cultural cognition and intercultural communication. Cultural teaching in foreign language teaching has gone through three major stages, from focusing on reading ability to cultivating communicative competence and now to cultivating intercultural communicative competence. Cultural knowledge transfer method and cultural process teaching method have been formed. There have been four kinds of teaching modes: foreign culture mode, cross-culture mode, multicultural mode and hyper-culture mode (Penman & Ratz, 2015). Intercultural Communication Theory expounds the connotation of culture, the principle of communication, communicative competence, the connotation of intercultural communication, intercultural communicative competence and cultural differences. In intercultural

communication, each participant understands others' discourse according to his own culture and foresight, which can easily lead to misunderstanding and even lead to complete failure of communication. According to the principle of intercultural communication, the ideal goal of teaching a foreign language is to enable students to use their language to communicate with others. This requires students to develop cross-cultural communication skills.

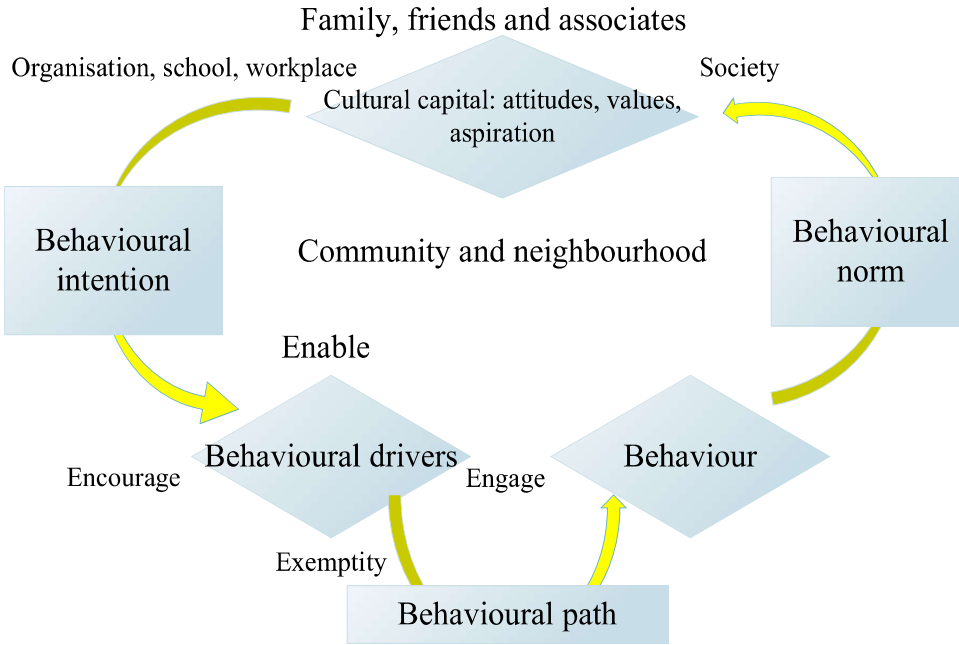

Figure 2. Development of cultural pluralism

Linguistic Aptitude and Grammatical Sensitivity

Language aptitude is an important aspect of second language acquisition individual differences (Wu, 2016). In addition to age, linguistic ability is one of the individual differences that can predict the outcome of second language learning. Later, linguistic research produced a large number of linguistic test questionnaires. The most famous of these are the Modern Language Aptitude Test (MLAT) developed by Carroll with Sapon (1959) and the Pimsleur Language Aptitude Test (PLAB).

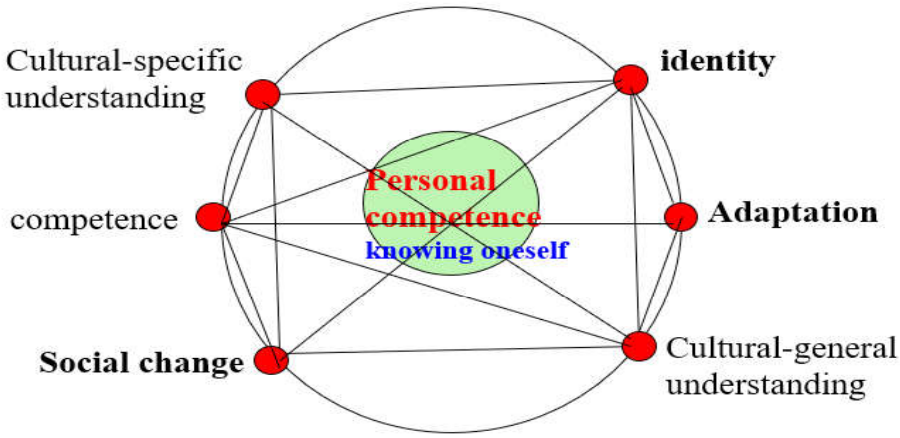

Figure 3. Culture learning outcomes

According to Carroll's research, linguistics mainly includes the following four cognitive abilities. Rote learning ability is the ability to form and remember the link between a word in a native language and a word phrase in a foreign language. Phoneme code ability is the ability to distinguish between different sounds. The phonemic code ability is a very special part of linguistics that is particularly crucial in a spoken language class. Grammatical sensitivity can recognize the grammatical function of a sentence, which is particularly critical in a classroom focused on analytic methods for learning foreign languages (Yang, 2018). The inductive language learning ability is the ability to bypass analogy from some language examples.

In language teaching, teachers can use MLAT as the main measurement tool and analyze the advantages and disadvantages of students in language ability, which can be used as the reference basis for selecting talents (Ghamarnia, Soltani, & Rahimi, 2016). MLAT can also help teachers design teaching activities that match their students. Now when the U.S. military selects foreign language talents, they still base on MLAT test questions. It can be seen that the language test can really predict the language learning language learners.

According to Carroll's explanation, grammatical sensitivity refers to the ability to discriminate grammatical functions of sentence patterns and sentence components, that is, the ability to analyze grammatical functions of language materials under the premise of unknown grammatical terms (Ostovar *et al.,* 2017). On this basis, Skehan's viewpoint of three elements of linguistic ability tries to link linguistic ability with the process of information processing of language learning. Among them, linguistic analysis (including Carroll's grammatical sensitivity) is

closely linked with the central processing stage of information processing. The capabilities of this phase are summarized, generalized, deduced and reconstructed. The imported language material is processed to form a coherence, which lays a solid foundation for the formation of grammar rules.

Research Design

Data Source

The total number of subjects was 30, 11 men and 19 women. All of the subjects were fourth year undergraduates majoring in English at a college in China. According to the first 3 years of English major's average ranking, we select the top 15 and the last 15.

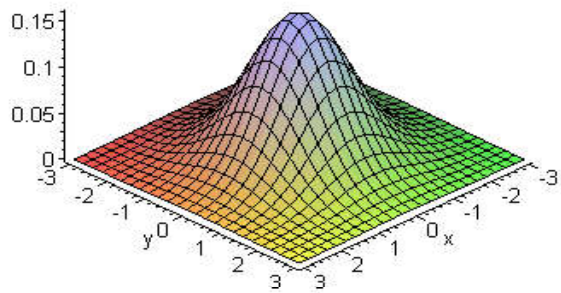

Figure 4. Surface figure of bivariate normal distribution

Test questions preparation and scoring

The experiment uses self-test questions, guidance and prompts are used in Chinese. The questions are divided into a total of 8 parts, a total of 7 kinds of questions.

(1) *Make words*. This section uses a 5-level scale, from "completely acceptable" to "totally unacceptable." The respondents gave the correct answer to 4 points, one point less for each level. The completely wrong answer is 0 points.

(2) *Subject judgment*. This section is composed of 10 Chinese sentences, some of which are verb-free sentences but have seemingly-themed ingredients at the subject's location. While the subject of some other sentences are deceptive, it is easy to be mistaken for the main clause. The test

requires subjects to determine whether there is a subject, and then make a supplement. Judgment is 2 points, the supplement is 8 points.

(3) *English-Chinese ambiguous sentence*. Part 3 and 4 are the same type of questions: the exclusion of sentence ambiguity. The former uses English sentences, the latter uses Chinese sentences. Subjects were asked to determine whether there is ambiguity and then find out the ambiguity. Judgment is 2 points, excluding ambiguity is 8 points.

(4) *Sentence extension*. This section uses five English sentences, each sentence contains only the minimum necessary components (Taguchi & Collentine, 2018). Subjects need to add as many sentence components as possible and ensure that the grammar in the sentence is correct.

(5) *Sentence reduction*. This section gives five longer Chinese sentences. Subjects were asked to ensure that the grammar is correct, reduce its components to a minimum. Each question is 20 points.

(6) *The word in the sentence*. There are 6 items in this section, each containing 2 Gaelic sentences. Subjects were asked to identify a word or phrase in the second sentence.

(7) *Paragraph reading*. This section uses a section of Old English as the material (Taguchi, 2015). The material will prompt the subject how many ancient English nouns and specific sentence patterns. Subjects need to use different symbols identified.

Before the experiment, the tester read the instructions to the subjects: This test is for scientific research only (Chung-Ying, Griffiths, & Pakpour, 2018). The results of the test are only used for this study and should not be used in any way that is unfavorable to the students. This test includes a total of eight sections. Classmates should complete in 50 minutes. The first question has a demo part.

This experiment uses SPSS large statistical software for data statistical analysis. Experiments using Pearson correlation coefficient method, two-tailed test, confidence interval $\alpha = .05$. Since this study is a preliminary study, the purpose is only to find out whether the tendency of linguistic aptitude is measurable and find possible test factors. However, it is unrealistic to find out all the factors in an experimental study (Jiang & Wang, 2018). Therefore, based on the data of this experiment, this paper predicts the linguistic tendency of Chinese students and their foreign language learning performance.

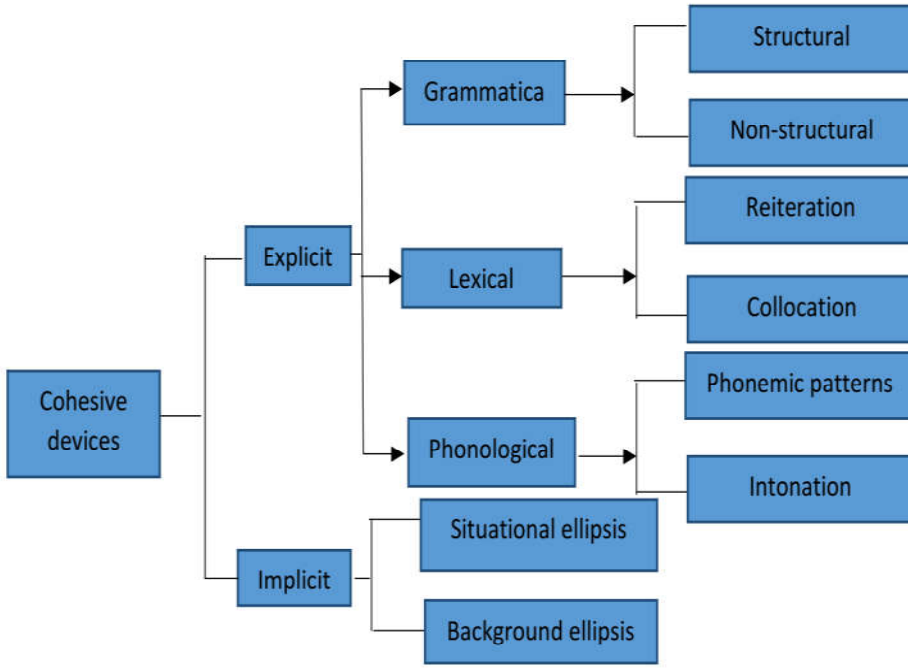

Figure 5. Main components for grammar

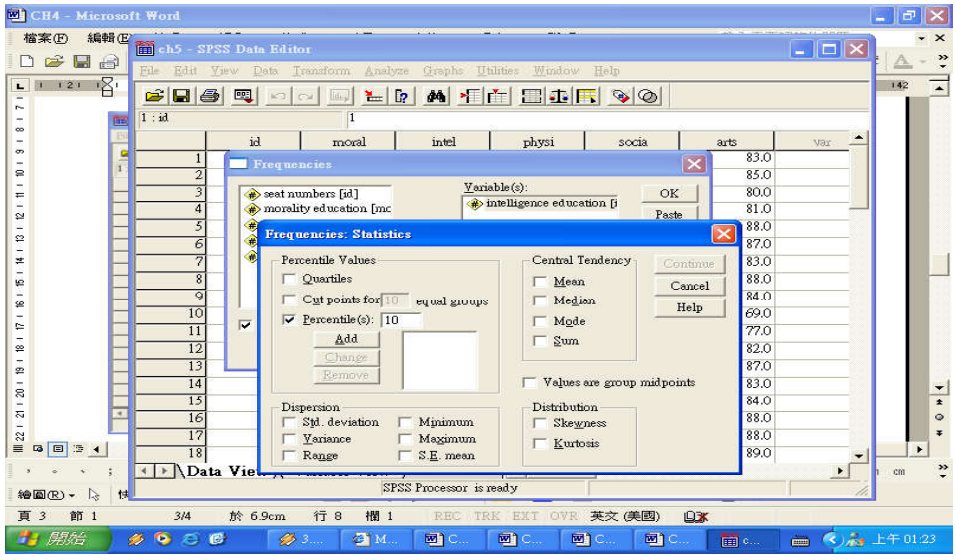

Figure 6. The operating interface of SPSS

The Pearson correlation coefficient method is a statistical method that accurately measures the closeness of the relationship between two variables (Nie, 2017). For two $_x$ and $_y$, several sets of data can be obtained through experiments, denoted as $(xi,yi)(i=1,2,...,n)$ then the mathematical expression of the correlation coefficient is

$$r = \frac{\sum_{i=1}^{n}(x_i - x)(y_i - y)}{\sqrt{\sum_{i=1}^{n}(x_i - x)^2 \sum_{i=1}^{n}(y_i - y)^2}}$$

If: $a= =Y -b*X$. We called b regression coefficient

$$b = \frac{\sum(x - X)(y - Y)}{\sum(x - X)^2} = \frac{L_{xy}}{L_{xx}} = SP / SS$$

In equation (1),$_x$ and $_y$ are the mean values of n test values respectively. The value of the correlation coefficient r ranges between -1 and +1, that is $|r| \leq 1$. When is closer to 1, the higher linearity is associated with y. If $|r| > 1$, indicating a completely negative linear relationship between x and y; if r = +1, indicating a completely positive linear relationship between x and y; if r = 0, indicating that there is no linear correlation between them.

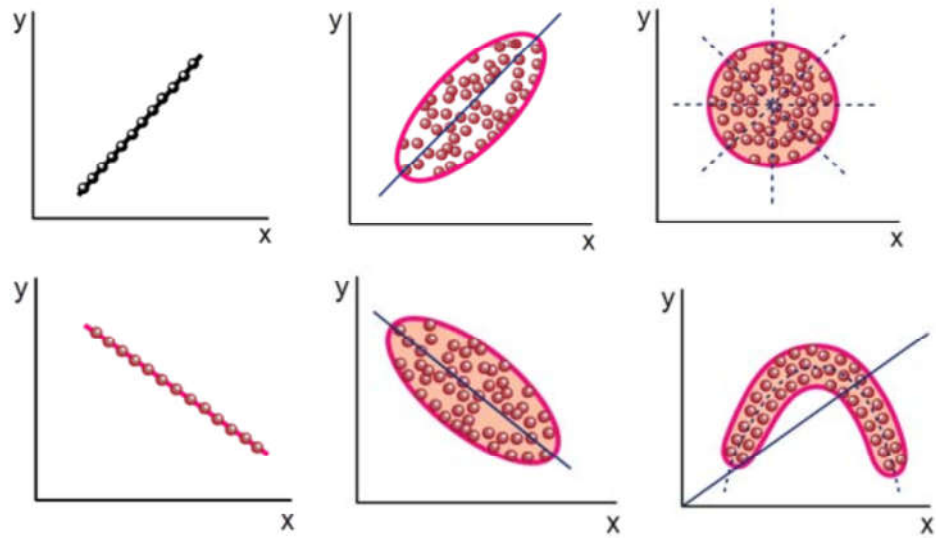

Figure 7. Different shape of the linear correlation equation

Under normal circumstances, the value of r is between (-1,1). The degree of correlation can be divided into the following cases: when $|r| > 0.8$, it can be regarded as highly relevant; when $0.5 < |r| < 0.8$ it is regarded as a moderate correlation; when $0.3 < |r| < 0.5$, it is regarded as a low degree of correlation. When $|r| < 0.3$, the correlation between the two variables is very weak and it can be considered as nonlinear correlation.

Evaluation and Measurement

In this experiment, we first calculate the average grade of each English majors in Grade 1 to Grade 3 of each participating university and then calculate the correlation coefficient with the score of grammatical sensitivity test (Koyanagi, 2018).

Parts 2, 4 and 6 are all Chinese topics. We designed these sections to find out whether grammatical competence in native language could predict its grammatical competence in foreign language learning for foreign language learners who are native speakers of Chinese. In other words, learners with good Chinese proficiency are more likely to learn a foreign language. Sections 7 and 8 use Gaelic and Old English (Wu, 2015). Both languages are natural languages and they are more systematic and powerful than artificial languages. Natural language is a living language that has been continuously developed by users after hundreds of years of evolution. The language structure of Old English is in line with natural language requirements, the system is very reliable. In the experiment it can avoid unnecessary human error caused by factors.

In these two parts, the subjects need to face unfamiliar language materials, through analysis, inductive derivation of their language form and grammar rules. Subjects can only judge the grammatical composition by the overall feeling of the language (Forsey, Broomhall, & Davis, 2012). This can be a comprehensive test of the subjects' grammatical sensitivity and language inductive ability. In a similar way, Part 1 uses words created in accordance with the pronunciation rules of English to give lexical meaning to demos. Subjects can make judgment on the grammatical function of the words by feeling, so as to avoid unnecessary errors caused by subjects' differences in vocabulary. All test scores are valid. The experimental data statistics are as follows.

Table 1. Correlation coefficient table of test scores and professional courses' average score

	Intensive reading	Extensive reading	Conversation	Audio-visual	Hearing	Writing	Translation	English grammer
The total score	.513* *	.407* *	.511* *	.504* *	.319	.504* *	.408* *	.585* *
Part 1 scores	.349	.307	.562* *	.533* *	.120	.484* *	.509* *	.509* *
Part 2 scores	.162	.126	-.054	.064	-.018	.125	.032	.141
Part 3 scores	.558* *	.418* *	.402* *	.535* *	.454* *	.478* *	.283	.494* *
Part 4 scores	.081	.100	.001	-.045	-.131	-.132	.047	.148
Part 5 scores	.437*	.301	.533* *	.435*	.420*	.650* *	.294	.480* *
Part 6 scores	-.106	-.242	-.089	-.189	-.062	-.103	-.222	-.221
Part 7 scores	.033	.100	.036	.105	.037	.068	.229	.090

Note: "* *" α=.01; "*"α=.05

From the above table, the total score in the test was significantly correlated with the usual scores of intensive reading, conversational, audio-visual, writing and English grammar ($p<.01$); the total score in the test is significantly related to reading and translating ($p<.05$). The relevance of Part 1 (Creation Word) to conversational, audiovisual, writing, translating and English grammar was particularly significant ($p<.01$). Part 3 (English-speaking ambiguous sentence) was particularly significant in relation to reading, listening, writing and English grammar in usual grades($p<.01$); it was associated with extensive reading, conversation and hearing ($p<.01$). The relevance of Part 5 (Sentence Extension) to conversational, writing and English grammar in normal grades was particularly significant ($p<.01$); it was significantly associated with intensive reading, audiovisual and audition($p<.01$). Part 8 (paragraph reading) was significantly associated with English grammar ($p<.01$).

It seems from the experimental results, the test overall and subjects intensive, extensive reading, conversation, audio-visual, translation, English grammar, writing and other professional courses have a strong correlation. We can say that in the test, students who had good English study usually achieved better results in this test. They are more sensitive to grammar than those who do not usually have good grades in English (Takayama & Takahashi, 2017).

Except for the fact that Part 5 is strongly related to intensive reading and weakly related to extensive reading, the rest of the questions in this test are generally associated with intensive reading and are generally in agreement with extensive reading. That is, the part related to intensive reading is also related to extensive reading and the weaker part related to intensive reading is also weakly related to extensive reading. And the relevance of intensive reading is higher in the first six sections than in extensive reading. This may be related to the characteristics of intensive and extensive reading classes. The focus of intensive reading is to give students a detailed explanation of the meaning of vocabulary, the use of new words, grammatical functions and the analysis of sentence structures. The focus of extensive reading exercises is to apply the language of knowledge learned through context analysis of the article. This ability needs to be based on a certain amount of grammatical knowledge, which places greater emphasis on language inductive ability. This conclusion is just in line with the design of this test question. Subjects must learn from their past experience in language learning and use language inductive ability to analyze its grammatical function to solve the problem.

The conversion of thought to speech is a process of linearizing ideological propositions into the structure of speech. So in the process of achieving the conversation there are several steps involved grammar. This is a good explanation of why the conversation and writing in this test are very consistent with the relevance of each part of the test. Because writing and conversation are very similar in the basic steps of realization, they have more time to consider the words to make the expression more accurate and appropriate. Therefore, the correlation between writing and test questions are higher than the conversation in this experiment.

Some of the test and audio-visual part of the correlation was significantly higher than the correlation with hearing, such as the first 1 and 3 parts. This may be related to the examination of two courses. Audio-visual exams not only examine the students' listening ability, but also examine their writing skills. After they have watched the video, they have actually formed the content of the video. Then they translate the schema into the language to express it. Therefore, it can be seen from the table that the correlation between audio-visual and test questions is basically consistent in writing. Listening tests generally allow students to do a large number of objective multiple choice questions based on a dialogue or essay with very few subjective contents. Students use grammatical knowledge significantly less than the place of audio-visual.

Discussion

A surprising finding from this experimental study is that all of the Chinese test sections failed to relate to the subjects' academic performance. Even in the same type of questions in both Part 3 and Part 4, the English part is related to the English learning effectiveness of the participants while the Chinese part is irrelevant. In particular, there is a negative correlation between Part 6 and the grades of all subjects. This shows that the lower the score in this part of the students, the better grades in all subjects examination. This is inconsistent with our prediction. This paper argues that the reason may lie in the huge differences between English and Chinese grammar. Chinese is a pictorial language and the Chinese psychological mechanism may indeed involve the left and right brains. However, English does not have any pictographic form and its main processing center is the left brain. This can also be circumstantial evidence from the difference between the two languages of Chinese and English in the "speech transcription effect". Due to the differences in speech psychological mechanisms, the syntactic sensitivity of a language may not be very similar to completely different languages. So it is not hard to understand that some of us have a very good Chinese language and can even write beautiful poems on very neat pairs, which cannot be done in English. By the same token, although English-Chinese translation is generally strongly related to the test questions, it can be seen from the table that except for the strong correlation with Part 1, English-Chinese translation has no correlation with the rest of the test. If this is confirmed in future studies, the truth seems to be that this article seems to yield a very interesting and also very interesting finding: the similarity of syntactic sensitivities among linguistic users of different languages in the world is very low, which implies that the syntactic sensitivity of one language cannot be used to detect the tendency of learners to learn the learning ability of different languages in another language family. Syntactic sensitivity will be language-specific.

Another unexpected finding from this study is that there is no correlation between grades in Section 7 and Part 7. Only English Grammar results are strongly related to Section 8. The two parts of the original assumption has a strong correlation. The test design conforms to the theory of Carroll, except that he is designed in artificial language. The second reason is that in the design of questions, Part 7 should reduce the difficulty, supplement more contextual information and give more material. For unfamiliar languages, merely relying on two independent sentences to speculate on their grammatical functions is too difficult for the participants. If this is the case, then Carroll's artificial language approach should be more reasonable than our natural language approach. However, this problem has not yet been solved. Because the previous accidental finding was established, then the lack of correlation between this part and learning effectiveness can be attributed to the linguistic differences between the test language and the tested mother tongue.

Conclusion

Because the normal English students with good grades in this test has achieved good results. The normal English students with good grades are more sensitive to grammar than those who do not usually have good grades in English. Therefore, there are linguistic tendencies in foreign language learners who are native speakers of Chinese. And grammatical sensitivity as one of the components has played a certain influence. Second, the four parts of the test questions designed in this article: the creation of words, the interpretation of English ambiguity, sentence expansion and paragraph reading may be effective means to test the Chinese learners' tendency to learn English. With the continuous development of the social environment, the means of learning continue to improve. Intercultural communication skills of foreign language learners change and affect the result of learning the language. Finally, under the circumstance of learning different second foreign languages, the linguistic tendency tends to be disturbed by many factors. Chinese grammatical sensitivity cannot be used as an indicator to test foreign language aptitude in Chinese-speaking learners. Among them, the first conclusion is consistent with the findings of Liu Runqing. These three conclusions can solve some of the problems raised by us at the beginning. But the third conclusion from the experiment is contrary to our common sense, which needs further research to solve it.

Acknowledgments

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