A Contrastive Analysis of Cognitive Processes of Bilingual Sight Translation

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***Abstract* - As a unique type of translation which is different from translation and interpretation, the sight translation (ST) and its biological cognitive process lack enough attention and research around the world, and the relevant research is even less in China. Based on the cognitive mechanism of sight translation, this research introduced the features of sight translation, made a contrast analysis of cognitive efforts between English-Chinese sight translation and Chinese-English sight translation by empirical study, distinguished the major elements that composed biological sight translation cognitive efforts and advanced a new model for biological sight translation cognitive efforts. Thus, this study should be helpful to improve sight translation ability of English majors in china.**

Keywords - Sight translation; Biological Cognitive efforts; Contrastive analysis; Cognitive effort model

I. INTRODUCTION

On-sight interpreting is defined as the interpreter is interpreting what he (she) is listening while looking through the text and following the speed of speaker [1]. On-sight interpreting has two specific categories, one is sight translation, and the other is sight interpreting. Sight translation means the interpreter is interpreting what he (she) is reading in target language while looking through the text which is written in source language. Canadian linguist Lambert firstly proposed the concept of sight translation and sight interpreting in his research in 2004, but he did not make a further and clearer explanation on cognitive process of sight translation. On account of English and Chinese belongs to two different language families, that is, English belongs to indo-European languages while Chinese belongs to Sino-Tibetan languages. In addition, English is an alphabetic writing system while Chinese is an ideographic writing system. As a result, differences between these two writing systems fully embody heterogeneity of English and Chinese. The existence of linguistic heterogeneity would cause different cognitive efforts during interpreting process for interpreters who have different language. Hence, it is very essential to distinguish the difference of sight translation cognitive efforts between English-Chinese sight translation and Chinese-English sight translation.

II. COGNITIVE EFFORT MODEL OF SIGHT TRANSLATION

Daniel Gile first described different translation difficulty level of simultaneous interpretation, consecutive interpretation and on-sight interpreting with interpretation effort model in 1995 [2]. He defined the efforts which are needed in interpretation process as cognitive efforts. The letter L stands for listening and analysis efforts, the letter M stands for short-term memory efforts, the letter P stands for speech production efforts, the letter C stands for the whole coordination process, the letter N stands for note-taking efforts, the letter SI stands for simultaneous interpreting, the letter CI stands for consecutive interpreting, the letter ST stands for sight translation and the letter SIT stands for sight interpreting.

According to Gile (1995), the cognitive effort model of simultaneous interpretation can be illustrated as followed equation:

$$SI = L + M + C + P \tag{1}$$

The equation means simultaneous interpretation is a complicated process which contains listening and analysis, short-term memory, coordination and speech production. Gile considered consecutive interpreting should consist of two periods, the listening and analysis and short-term memory occurred in the first period are the same as in simultaneous interpretation, but interpretation text is not produced in this period, and the note-taking is needed in this period. In this sense, the equation in this period should:

be:

$$CI = L + M + N + C \tag{2}$$

The second period of consecutive interpreting includes remembering and note-taking at the same time, so the equation of second period should be:

$$CI = \mathrm{Re}\, m + R + P \tag{3}$$

Gile (1995) simply illustrated the cognitive effort model of sight translation with the equation as:

$$ST = R + P \tag{4}$$

And Gile did not show the cognitive effort model of SIT (sight interpreting), but according to his theory and the relationship between sight interpreting and simultaneous interpreting, the cognitive effort model of sight interpreting can be concluded as:

$$SIT = ST + SI = R + L + M + P + C \tag{5}$$

As it can be seen from Gile's cognitive effort model of sight translation, he considered that the sight translation can be finished only by reading and speech production, without memory or other segments participation. However, based on his later hypothesis, now that there is a competition of processing capacity requirements among listening analysis, speech production and short-term memory, which means listening analysis and short-term memory or short-term memory and speech production may work simultaneously, and this process is a dynamic comprehend-process-output process. In the same way, as the unique type of interpretation, sight translation can not be finished only by reading and speech production. The reasons are: first, the text information which is received by vision can be stored in the brain only with the short-term memory participation. Second, the information stored in the brain has to be understood and processed so that can achieve segmentation and reconstruction. Third, the information which has been transformed has to be activated with the short-term memory participation again, finally, the activated information forms speech production. For this reason, comprehension and short-term memory run through the whole process of sight translation. Moreover, the cognitive process is not a straightforward linear process, but a dynamic multi-dimensional process. In view of above reasons, the author considered the cognitive effort model of sight translation should be:

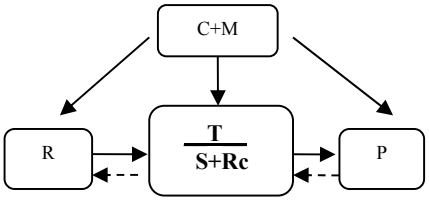

Fig. (1). The Cognitive Effort Model of Sight Translation

In this model, the letter C stands for comprehension, the letter M stands for short-term memory, the letter R stands for reading, the letter T stands for transformation, the letter S stands for segmentation, the letter Rc stands for reconstruction, the letter P stands for speech production.

The cognitive process which is made up of reading transformation and speech production is not one-way, but partially reversible, which is because sight translation includes text information. Although the cognitive process is partially reversible, it mainly focuses on the process from reading to transformation to speech production (solid lines with arrows), accompanied with the reversible process from speech production to transformation to reading (dotted lines with arrows). The whole sight translation cognitive process can be achieved with the aid of comprehension and short-term memory. The transformation process includes segmentation and reconstruction, which is the core segment of sight translation. And the competition of processing capacity requirements proposed by Gile (1995) is fully embodied in this segment.

III. THE FEATURES OF SIGHT TRANSLATION

Sight translation is the combination of interpretation and translation. A number of undergraduates who are majored in English always think sight translation is much easier than sight interpreting when they begin to learn sight translation, because they do not need to worry about listening comprehension and note-taking [3-5]. But they gradually realize that sight translation is not easy after a lot of practice, since sight translation requires many skills which should be coordinated quite well, such as reading comprehension, segmentation, short-term memory and speech production. On the basis of past researches [6-8], most experienced interpreter would rather interpret for impromptu speech than sight translation, as the word in the text with no hint is a kind of constraint for interpreters, and these words cause difficulties for segmentation to some extent [9-11]. Consequently, interpreters have to pay much more energy to get rid of source words. The sight translation always requires a certain period of time for quick reading, and interpreter has to interpret quickly, accurately and fluently in limited time. The reading speed, segmentation ability, understanding of text background and bilingual transform ability of interpreters would cause troubles for sight translation in the whole process [12]. Since sight translation needs the reading and interpreting coordinating at the same time, so the paragraph should be divided into several sense groups during reading process, and then be interpreted one by one. In the whole sight translation process, interpreter has to accomplish sense group segmentation and integration successively so that the meaning of interpretation can remain coherent.

IV. EMPIRICAL RESEARCH

A. Questionnaire Survey

In May, 2013, the writer made a questionnaire survey about the cognitive process of English-Chinese and Chinese-English sight translation. The samples are 86 senior English majors of 2 classes who come from Anhui Polytechnic University. Before the questionnaire survey, all these students have got more than 120 hours class interpreting practice systematically. The purpose of this

questionnaire survey is to discover senior English majors' cognition of cognitive process of English-Chinese and Chinese-English sight translation, in addition, to find out all kinds of problems emerged in the process of English-Chinese and Chinese-English sight translation. The time length of questionnaire survey is 10 minutes, totally 86 questionnaires were sent out and 84 valid ones were retrieved, the valid rate was 98%. The questionnaire was designed in the form of multiple choice questions, there are 20 questions, including 3 parts. The first part is difficulty comparison between English-Chinese sight translation and Chinese-English sight translation, and the reasons which cause sight translation difficulty. The results show that there are 62% students think Chinese-English sight translation is more difficult than English-Chinese sight translation. In the choices referring to difficulties which cause English-Chinese sight translation, there are 82% students choose lexical access and selection, which is considered to be the essential element which cause English-Chinese sight translation difficulty. Yet in the choices referring to difficulties which cause Chinese-English sight translation, there 42% students choose lexical access and selection as the essential element which cause Chinese-English sight translation difficulty, and 28% students choose grammar structure difference, and 22% students choose expression habit difference as the key element. The second part investigates the differences of tense, number, part of speech, and word order usage between English and Chinese. From answers of students, more than 70% students agree that there are big differences of tense, number, part of speech and word order usage between English and Chinese. The third part investigates the differences of syntactic structure between English and Chinese, answers show 41% students think the subject usage in sentence is the same between these two languages, 53% students ignore the passive voice in Chinese-English sight translation, and 37% students think they have word order transformation problems in Chinese-English sight translation.

TABLE 1: MİSTAKE ANALYSİS OF C-E SİGHT TRANSLATİON TEST

Total items	Mistakes number	Percentage	Specific items	Mistakes number	Percentage
Vocabulary	118	42%	Preposition	25	9%
			Article	20	7%
			Conjunction	8	3%
			Derivative	17	6%
			Verb	34	12%
			Noun	14	5%
Grammar	96	34%	Tense	17	6%
			Number	14	5%
			Subject-verb agreement	31	11%
			Voice	20	7%
			Word order	14	5%
Other items	67	24%	Other items	67	24%
Total	281	100%	Total	281	100%

TABLE 2: MİSTAKE ANALYSİS OF E-C SİGHT TRANSLATİON TEST.

Total items	Mistakes number	Percentage	Specific items	Mistakes number	Percentage
Vocabulary	95	49%	Preposition	19	10%
			Adjective	3	2%
			Adverb	9	5%
			Conjunction	14	7%
			Pronoun	17	8%
			Verb	24	12%
			Noun	9	5%
Grammar	58	30%	Collocation	19	10%
			Multiple expression	8	4%
			Logical structure	12	6%
			Voice	9	5%
			Word order	10	5%
Other items	40	21%	Other items	40	21%
Total	193	100%	Total	193	100%

And then we obtained the other test results, as table 2.

B. Experimental Study

A week later after questionnaire survey, all 86 students had a test of Chinese-English sight translation and English-Chinese sight translation. The test paper was designed in the form of 20 sentences, 10 of them were selected from English Interpretation Practice Level 3, and the other 10 sentences were selected from Business English Interpretation. The test is expected to answer following questions: (1) What specific mistakes students make in Chinese-English sight translation and English-Chinese sight translation? (2) What are mistakes caused by negative transference of mother language in all mistakes? (3) What different cognitive loads Chinese English learners will have in Chinese-English sight translation or in English-Chinese sight translation? The analysis results are as follows by analyzing students' test record.

V. EXPERIMENTAL RESULTS ANALYSIS

In terms of total number of mistakes, all students make 193 mistakes in English-Chinese sight translation, while they make 281 mistakes in Chinese-English sight translation. The total number of mistakes in English-Chinese sight translation is 31% less than in Chinese-English mistakes, and this result is generally the same with the conclusion in questionnaire survey that most students think Chinese-English sight translation is more difficult than

English-Chinese sight translation. From the selected items that cause sight translation mistakes, it is obvious that the linguistic factors, such as vocabulary and grammar, which are key elements that cause sight translation mistakes (which accounts for 76% and 79% respectively). Nevertheless, the non-linguistic factors, such as culture and situation, they cause rather less sight translation mistakes (only 21% and 24% respectively). But the specific items that cause Chinese-English sight translation mistakes are different from the items that cause English-Chinese sight translation mistakes. In terms of lexical level, there are 7 parts of speech that can cause English-Chinese sight translation mistakes, while there are 6 parts of speech that can cause Chinese-English sight translation mistakes. Among these parts of speech, article and derivative are two specific parts of speech that cause Chinese-English sight translation mistakes. Since article is the unique part of speech in English, there is no article concept in Chinese, so Chinese interpreters always leave articles in the process of Chinese-English sight translation. Meanwhile, derivative is a very important word-formation method in English.

The word meaning and part of speech will change with the changes of prefix and suffix in English, yet the word meaning and part of speech are rather fixed in

Chinese, lacking abundant affix changes. Furthermore, the morphologic function and grammatical function of English suffix are much more advanced than Chinese, thus this will cause misuse of derivative in the process Chinese-English sight translation. On the other hand, in the process of English-Chinese sight translation, the mistakes caused by pronoun take up to 8%. The reason is that pronouns are interpreted literally, which make the substitutes have ambiguity meaning, so that listeners can not understand correctly. Since there are many kinds of pronouns in English, and the pronouns are used quite frequently. Although there are also pronouns in Chinese, such as he, she, it, these pronouns only have differences in literal, they have no difference in pronunciation. If we interpret these words literally and do not clear its original meaning, the listeners will easily misunderstand what substitute is. The mistakes caused by adverb misuse account for 5%. For the modified function of English adverbs is much more advanced than Chinese, it can not only modify verb, adjective, but can modify preposition, noun even the sentence. Meanwhile, the positions in sentence of adverb in English are more flexible than Chinese. The mistakes caused by conjunctions in English-Chinese sight translation are more than in Chinese-English sight translation, which is because English emphasizes hypotaxis while Chinese emphasizes parataxis. Owing to the requirements of formal structure, conjunctions are used more frequently in English than in Chinese. If we always interpreted conjunctions literally, it will make repetition of contents even mistakes. Most mistakes caused by prepositions and nouns both in English-Chinese sight translation and Chinese-English sight translation are related to verbs, and this mainly refers to transformation of verbal part of speech. Generally, an English sentence only has one predicate verb, but a Chinese sentence can have several verbs. Comparatively, Chinese has more verbs but less prepositions, and verbs are used more frequently in Chinese than in English.

In terms of grammatical level, only voice and word order are the same item among all items that cause mistakes in English-Chinese sight translation and Chinese-English sight translation, since the expressing function of these two items are corresponding in English and Chinese. For example, the Bei (Chinese character) sentence in Chinese can be used to express the passive voice in English. In order to achieve the semantic coherence of sentence, word order is very necessary when make sight interpretation. There is no definite tense concept and no number changes of verb in Chinese, and Chinese does not need to follow strict rules of subject-verb agreement. Thus, when we do Chinese-English sight translation, the correspondent items are always misinterpreted in English. At the same time, more flexible collocations, more various multiple expression and more complicated sentence logical structure make troubles to English-Chinese sight translation. By comparing interpretation text of English-Chinese and Chinese–English sight interpretation, it is found that the negative transference of Chinese as mother language is the most important reason which causes mistakes in Chinese-English sight translation for Chinese students. And the effects embodied in every linguistic level. This finding is consistent with the research made by Gile and Agriofoglio[13], i.e. the reasons why we made misinterpretation and omissions in sight translation are not understanding problems, but expressing problems, or lacking of capacity that can resist interference between source language and target language. This language interference — the negative transference of Chinese as mother language， is embodied in Chinese-English sight translation, which indicates mistakes made in Chinese-English sight translation is a kind of output mistake. By contrast, most mistakes made in English-Chinese sight translation are caused by the misunderstanding of source language, which is a kind of input mistake. Furthermore, it can be inferred that processing capacity in different cognitive stages of English-Chinese sight translation is different from that of Chinese-English sight translation, that is, allocation of cognitive effort is different. This hypothesis can be described as the following models:

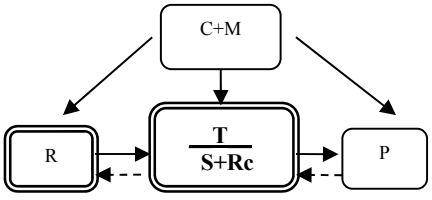

Fig. (2). The cognitive effort model of english-chinese sight translation

From model 2, we can see, in the process of English-Chinese sight translation, comprehension and short-term memory take part in every stage of the whole process all the time, interpreter inputs information by reading, and then information enters transformation stage. In this stage, if information can be transformed smoothly by segmentation and reconstruction, the information will be expressed by speech production successfully, and the whole sight translation process will be finished. But if information can not be transformed smoothly in transformation stage, interpreter will go back to reading stage and input information again. And if information can not be expressed in speech production stage, interpreter will go back to transformation stage to process information again. Therefore, from reading to transformation, and from transformation to speech production, the cognitive process is partially reversible. In this model, double line means the main stages that cognitive effort allocated. In the process of English-Chinese sight translation, the cognitive efforts are mainly allocated in reading stage and transformation stage. It illustrates that information input and process are more difficult when interpret from foreign language to mother language.

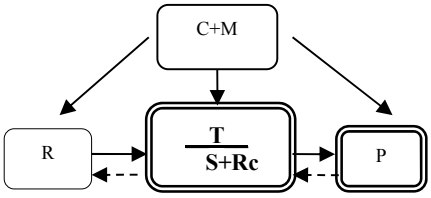

Fig. (3). The Cognitive Effort Model of Chinese- English Sight Translation

Model 3 shows that in the process of Chinese-English sight translation, the cognitive efforts are mainly allocated in transformation stage and speech production stage. Which illustrates that information process and output are more difficult when interpret from mother language to foreign language.

VI. CONCLUSION

A. Findings of the Study

The misunderstanding of English as source language is the essential reason which causes mistakes in English-Chinese sight translation, while the negative transference of Chinese as mother language is the most important reason which cause mistakes in Chinese-English sight translation. Different reasons indicate different allocations of cognitive efforts in sight translation. In other words, different sight translation require different processing capacity, the cognitive efforts are mainly allocated in reading stage and transformation stage in English-Chinese sight translation, yet the cognitive efforts are mainly allocated in transformation stage and speech production stage in Chinese-English sight translation.

B. Shortcomings of the Study

There are several shortcomings in this study, such as sample size (86 students took part in the test), sample level (students can not have the same English or Chinese level), empirical data (interpretation text assessment might be subjective) and etc.

CONFLICT OF INTEREST

The author confirms that this article content has no conflicts of interest.

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