Interpreter Training and Students of Interpreting in China

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ABSTRACT

Previous research in interpreter training has covered such areas as teaching methods, evaluation means, curriculum designs and interpreting competence. Researchers at Guangdong University of Foreign Studies in China have been working together to look closely at students of interpreting, something which they consider of critical importance when striving to improve the efficiency of interpreter training. The present paper is mainly a summary of their research on undergraduate students of interpreting (the largest group of students of interpreting, about half a million in China). Major findings include: 1) L2 proficiency is the major individual difference that predicts how much these trainees (as unbalanced bilinguals) will gain from interpreter training; 2) Anxiety is a critical individual difference for interpreting performance, and interpreter training helps trainees enhance their interpreting competence probably by enhancing the coordination of their componential abilities; 3) Motivation, critical to interpreter training, is influenced by many other factors, and changes overtime during the first one

or two years. Pedagogical implications and future research directions are discussed.

KEYWORDS

Interpreter training, students of interpreting, individual differences, interpreting anxiety, L2 proficiency

1. Introduction

With increasing communication between China and the world, there is an increasing need for translators and interpreters. To meet this need, universities and colleges across the country offer various training programs to students of interpreting. There seem to be an increasing number of students applying for such programs, and Translation and Interpreting (Henceforward T & I) has become a popular subject/major in many universities in China.

This unprecedented prosperity in T & I training is a great encouragement to instructors since it indicates that their profession is on the rise and has received recognition from society. On the other hand, it brings worries too because the growth is too rapid and many universities offering T & I training are not yet ready in terms of teaching staff, management skills, or curriculum design, etc. (Zhan 2014; Zhong 2014a).

Responding to the challenges, interpreting trainers and instructors in China have embarked on research. Their work has advanced our understanding of the field; trainers and students both benefit from their contributions. There have been speculations and reflections on interpreting teaching itself (e.g., Zhong 2007; Liu 2009), theoretical formulations (e.g., Dong and Wang 2013) and empirical research

about interpreting processes (e.g., Dong and Lin 2013), explorations about interpreting research methods (e.g., Wang and Mu 2008; Zhong and Wang 2010), surveys about interpreting product quality and user satisfaction (e.g, Wang 2013), and research on individual differences among students of interpreting (Cai *et al.* 2015; Dong *et al.* 2013; Wu 2015).

However, no matter how much progress has been made, many questions remain. As for T & I training, more research is definitely needed to probe into the nature of interpreter training empirically, using rigorously reliable and valid research designs. What is particularly lacking is empirical research on individual differences among students of interpreting, especially undergraduate students, the largest group among all students of interpreting, estimated to be more than half a million (see Section 3 for details). A better understanding of these trainees is critical for better curriculum design and more efficient training. Seeing the importance of this line of research, the psycholinguists from the Bilingual Cognition and Education Lab, together with the instructors and researchers from the School of Translation and Interpreting Studies at Guangdong University of Foreign Studies (广东外语外贸大学 Guangdong Waiyu Waimao Daxue, commonly known as *Guangwai*) have been working to advance the understanding of these trainees. We, as members of the Lab present in the present paper some of the major studies that have been conducted in this aspect, i.e., individual differences in undergraduate students of interpreting. A brief discussion of their pedagogical implications for T & I will be included at the end of the paper.

2. Research collaboration between psycholinguists and instructors of interpreting

The collaboration between psycholinguists and instructors of interpreting at *Guangwai* comes in many forms. First, we co-operate on research projects. In this type of collaboration, the instructors offer their experience about the practice in the field and raise practical problems/concerns in the course of their training programs, and the psycholinguists provide help in turning these concerns into feasible research questions and help creating research designs. In the implementation of the projects, the instructors provide participants and help collect data while the psycholinguists guarantee the validity of the process of data collection, conduct data analyses and write up reports. Upon completing the projects, both groups co-author journal papers and/or books.

In terms of cultivating students, students of either group may apply for the graduate program of the other group, and experts from either group may supervise students of the other group, or serve as committee members of a doctorate defense of the other group. The collaboration also works at the student level, especially at the graduate student level. Students of either group are free to attend the courses, workshops and seminars provided by the other group. Doctorate students from both groups often live in the same building provided by the university and have good personal communication in informal contexts.

The collaboration between psycholinguists and instructors at *Guangwai* is beneficial to both parties. Psycholinguists benefit from the input of the instructors and become more aware of the problems and issues in the field. Instructors benefit in terms of research skills,

especially empirical research skills; in addition, with knowledge and findings gained from empirical research, they are in a better position in their practice both as interpreters and trainers. More importantly, we believe this collaboration will lead to a better understanding about interpreter training, which will lead to better or more appropriate curriculum designs, text books, etc.

3. Interpreter training and students of interpreting

Discussions about interpreter training have to take trainees into consideration. In fact, we believe that trainees are the most important focus of attention to be discussed if we wish to improve interpreter training. The best interpreter training, if there is such a thing, must be the most appropriate for the trainees that receive such training. Among all the features of students of interpreting, we believe the most important factors are L2 proficiency, working memory, anxiety, and motivation. In this part, we introduce briefly basic information about interpreter training and students of interpreting in China.

3.1. Training programs and curriculum design

Currently, training programs in T & I are offered at both the undergraduate and graduate levels in universities in China. At the graduate level, two types of programs are offered. First, T & I as a specialization/orientation is provided in most foreign language departments. In addition to some introductory courses in linguistics and/or literature, graduate students take “specialization” or “oriented” courses in T & I chiefly for developing translation/interpreting skills. The specialization courses usually take up one third of their total

class hours (Wang and Mu 2011). The second type of T & I programs at the graduate level is taught as an autonomous discipline. This includes MT (Master's in Translation), MI (Master's in Interpreting) and MTI (Master's in Translation and Interpreting) programs. MTI programs are very popular in China; in 2014, 159 universities and colleges offered MTI programs to around 20,000 students (Zhong 2014a).

At the undergraduate level, there are also two types of T & I programs: 1) T & I as elective courses or compulsory courses alongside with other language courses; 2) T & I as an autonomous discipline. T & I as elective courses is provided in some universities and colleges to non-foreign-language majors. Often these students receive interpreter training for one or two semesters, the main purpose of which is to enhance their L2 competence like other language courses. T & I training is compulsory for almost all foreign language majors. The majority of foreign language majors are English majors. Their number is estimated to be more than half a million students (578,000) in 994 universities and colleges (Zhong 2014b). This vast number of English majors usually receive T & I training in their last two years out of a four-year university program. Among the English majors, a particular group of undergraduate students (Bachelor in Translation and Interpreting, BTI) receive T & I training as an autonomous discipline. Compared with other English Majors, they receive interpreter training slightly earlier (one semester earlier) and have relatively more courses (one or two specialized courses each semester). In 2014, 152 universities and colleges in mainland China offered BTI programs to around 14,000 students (Zhong and Zhao 2015).

As mentioned above, empirical research is badly needed for T & I training at both the graduate and undergraduate levels. However,

compared with those at the graduate level, published studies about T & I training at the undergraduate level are even scarcer. Given the large number of undergraduate students studying T & I and the scarcity of empirical studies concerning this group, our lab, working with instructors at the School of Translation and Interpreting at *Guangwai*, has focused on these students since 2009. In the following section, we will describe in detail the characteristics of this group of students.

3.2. Students of interpreting

Students of interpreting at the BA level fall into three categories: those who study T & I as elective courses, those who take them as compulsory courses, and those for whom T & I are an autonomous discipline. The first group of students generally attend one or two introductory courses in T & I for one or two semesters. The purpose of such courses is to enhance their foreign language competence rather than their T & I skills. Foreign language enhancement is by itself an important topic, but our focus is on T & I skills acquisition in the other two groups, because they will provide the potential workforce in the interpreting and translation market. The term "students of interpreting" in the following part, therefore, refers to the latter two groups unless specified otherwise.

These two groups are more broadly categorized as English majors (Zhong 2014b). According to the National College English Teaching Syllabus for English Majors (National Advisory Commission on Foreign Language Teaching in Higher Education 2000), the four-year English major undergraduate program in China is divided into two stages: the foundation stage (the first and second years) and the advanced stage (the third and fourth years). At the foundation stage,

all English majors receive various courses aimed at improving their basic English skills in listening, speaking, reading and writing. In their third year, they begin to receive training in their specialized field such as T & I, linguistics and applied linguistics, English literature, and so on. Most of the interpreter training that these two groups of students receive in the 3rd year is backward consecutive interpreting, i.e. interpreting from L2 (the second language, English) into L1 (the first language, Chinese), as recommended by experts in conference interpretation training (Seleskovitch 1999). Seleskovitch (1999) proposed that at the beginning stage of interpretation training, studying consecutive into one's A (L1) language was most beneficial. Since our trainees are trained mostly in consecutive, this is also the type of interpreting we focus on.

The majority of English majors study English at school for about ten years but they are generally considered unbalanced bilinguals because English is learned as a foreign language. Their L2 proficiency is generally considered intermediate, and is tested by TEM4 (Test for English Majors Band 4) which is administered annually to tens of thousands of intermediate English majors by the official National Advisory Commission on Foreign Language Teaching in Higher Education in China and is recognized nationwide as proof of English proficiency (Zou and Chen 2010). In one empirical study by Dong and Lin (2013), for example, all our 69 participants were recruited from third-year English Majors at *Guangwai* who had passed TEM4 at the end of their second year (with a score over 60 out of a total of 100), and their average score was 71.52 (SD=5.33), which was higher than the national average of 60.09.

Few of these students of interpreting have stayed more than one month in an English-speaking country and most of them learn their L2 in classroom settings. Since the classroom learning contexts often

produce large variation in their L2 attainment, there is likely a large variation in L2 proficiency in these students of interpreting, which may produce significant impact on how well they perform in their interpreting or translation classroom, and how well they develop their interpreting competence.

4. Individual differences among students of interpreting

One important issue in interpreter training concerns individual differences among students of interpreting: Why do some learners gain more than others despite receiving the same amount and type of training? In other words, what factors underlie the variation in the development of interpreting competence? Information about this issue has important implications not only for theoretical models of the process and development of interpreting but also for interpreter training. In this part, we will discuss briefly the major cognitive and psychological aspects of individual differences, then report on two of our previous studies on how individual differences influence interpreting performance and interpreting development (Dong *et al.* 2013; Cai *et al.* 2015), and one doctoral thesis on how the motivation of students of interpreting changes over the first one or two years (Wu 2015).

4.1. Individual differences

Of the many possible factors that underlie the development of CI (consecutive interpreting) competence for students of interpreting, the following factors are critical: L2 proficiency, lexical retrieval efficiency, memory capacity, anxiety and motivation. The first three are more

cognitive, and the last two more psychological (affective, to be more exact). Other factors such as syllabus design, faculty qualification, facilities, etc. are important too, but we prefer to focus on the cognitive and psychological factors here since it is not yet very clear how differences in these factors would lead to differences in interpreting performance and development.

L2 proficiency. Since interpreting involves two languages, it follows that the general proficiency in both languages is important for successful interpreting. It is generally assumed that Chinese undergraduate students in interpreting and translation have mastered their L1 because that is their mother tongue and because they had to perform well on the college entrance examinations to be admitted at university, a key subject of which is the Chinese language. However, as mentioned earlier, there is probably much variability in L2 proficiency among these students of interpreting given the results of two national English proficiency tests for English majors (Dong and Lin 2013; Jin and Fan 2011; Zou 2011; Zou and Chen 2010). Empirically, some initial evidence suggests that L2 proficiency plays a part in simultaneous interpreting performance (Tzou *et al.* 2012). Pedagogically, Bale (2013) suggested that interpreter training programs should strive to increase the candidate's L2 proficiency and, in practice, almost all interpreting programs in China incorporate some form of language exercises to enhance the candidate's L2 proficiency (Wang and Mu 2011). Therefore, there is reason to believe that L2 proficiency plays a role in the development of interpreting competence.

Memory capacity. Interpreting is a very cognitively demanding task, drawing heavily on memory processes. In a typical CI task, interpreters often need to comprehend at least a few sentences from the speaker and store the message in memory (sometimes with the help of notes) before being able to reproduce that message in TL. In

addition, interpreters cannot control the pace and content of the input, which places further cognitive demands on their memory. The importance of memory capacity is highlighted by the concept of "saturation" proposed by Gile (2009). Gile (2009) argued that the demanding nature of interpreting often saturates the interpreter's cognitive resources, leading to interpreting errors or failures.

In cognitive psychology, multiple memory is posited (Baddeley 1999). In interpreting studies, researchers are particularly interested in short-term memory (henceforward STM) and working memory (henceforward WM) (Köpke and Nespoulous 2006). Although the exact nature of STM and WM in neuropsychology and cognitive psychology more generally is debated (for an excellent review, see Aben *et al.* 2012), in the field of interpreting studies, STM generally refers to the system that temporarily stores information and WM to the system that both temporarily stores and manipulates information. Correspondingly, simple spans (e.g., digit span, word span) that mainly tap the maintenance of information are generally used to assess STM capacity, and complex spans (e.g., reading span, operation span) that tap both maintenance and manipulation of information are used to assess WM capacity.

The existence of different types of memory demands in interpreting performance is empirically supported. Christoffels *et al.* (2003) found that STM and WM were both related to interpreting performance, but in different ways. Furthermore, even WM itself had a different relationship with interpreting performance depending on the task (L1 versus L2 span). These results are consistent with the finding that different kinds of memory function differently in language processing (Chincotta and Underwood 1998; Daneman and Green 1986; Ikeno 2006; Köpke and Nespoulous 2006; Service *et al.* 2002). We believe that STM and WM play an important role in the development of CI

competence, but there is a question of what and how.

Lexical retrieval efficiency. Lexical retrieval efficiency refers to the speed and accuracy in accessing words. It is argued that efficiency in lexical retrieval, particularly the retrieval of translation equivalents, might be crucial to successful interpreting performance since the time spent finding the appropriate translation for an input word should be as short as possible given the time pressure of the interpreting task (Christoffels *et al.* 2003). This hypothesis is supported by empirical evidence. Christoffels *et al.* (2003) found that lexical retrieval efficiency indexed by word translation latency directly affected interpreting performance. Whether lexical retrieval efficiency affects the development of interpreting competence is another important question for interpreter training.

Anxiety. Anxiety has long been thought to be linked to interpreting performance (Brisau *et al.*, 1994; Jiménez Ivars and Pinazo Calatayud, 2001). Interpreters, especially simultaneous interpreters, who do not have the control of input rate and have to work under some noisy contexts, have to perform under constant pressure. This is especially so for students of interpreting (Chiang 2009). Therefore, there is good reason to believe that anxiety is likely to have an influence on the development of interpreting competence in students of interpreting. To measure the anxiety level of such trainees, we developed an interpreter anxiety questionnaire (Dong *et al.* 2013).

Motivation. "Motivation is the process whereby goal-directed activities are instigated and sustained" (Schunk, Meece and Pintrich 2013:5). In the field of interpreting, it mainly involves three questions: 1) What motivates students to pursue interpreter training? 2) How much effort do students invest in their interpreter training? And 3) How long are students able to keep on their training? Motivation, according to its definition, is definitely an important factor influencing

trainees' final attainment (Angelelli 2006; Fan 2012).

4.2. Individual differences and interpreting competence development

All the above factors are expected to influence students' interpreting competence development. More importantly, we believe that the influence of these factors upon the development of interpreting competence is dynamic; in other words, they function differentially at different stages of the training programs. In addition, these factors are likely to interact with each other. To examine their dynamic and interactive nature, we conducted a series of longitudinal studies and administered multiple sets of tests upon the same group of students of interpreting (Cai *et al.* 2015; Dong *et al.* 2013; Dong and Lin 2013; Dong and Xie 2014).

In one empirical study (Cai *et al.* 2015), we recruited 61 students of interpreting as participants to investigate the following research question: Do L2 proficiency, memory capacity, and word translation efficiency contribute to how well students develop their interpreting competence?

To answer the research question, we determined the contributions made by each independent variable (i.e., L2 proficiency, memory capacity, and word translation efficiency) in accounting for the variance in the improvement of the students' interpreting performance. The CI performance was measured twice: Time 1 (at the beginning of the third academic year) and Time 2 (at the end of that academic year), and the independent variables were measured only at Time 1.The time interval between Time 1 and Time 2 was around eight months. During these eight months, the students received formal training that was designed to enhance their CI competence (see "training programs and curriculum design"). By statistically removing

the students' initial CI competence, we investigated the role of different predicting factors (i.e., independent variables) in interpreting competence improvement.

The findings can be summarized as follows: 1) English proficiency significantly correlated with CI performance at both times; 2) Lexical retrieval efficiency and the digit span (i.e., short-term memory) had no statistically meaningful relationship with CI performance at either time; 3) Both English listening and speaking spans (i.e., WM measures) spans significantly correlated with CI performance at both times, while only Chinese speaking span significantly correlated with CI performance at Time 1; 4) Although English proficiency, English listening and speaking spans can each predict CI performance at both Time 1 and Time 2, only English proficiency can make a unique contribution in accounting for variance in the development of CI competence. The data suggest that L2 proficiency is probably the most important predictor of the development of CI competence in unbalanced students of interpreting and that short-term memory and working memory may play different roles in CI performance.

There are implications for CI training. First, at the beginning stage, it may benefit students more if instructors design exercises to improve their L2 proficiency compared with exercises to improve their memory capacity or lexical retrieval efficiency (for a similar suggestion deriving from a different perspective see Abuín González 2012). Second, the best candidates for interpreter training are those who have mastered their L2, which is easy to understand since it is in line with almost everyone's intuition.

4.3. Individual differences and interpreting competence structure

In another empirical study (Dong *et al.* 2013), we tried to examine

the relationship between language competence, psychological competence and interpreting competence. Altogether, 19 tests were administered to 52 participants at two stages of interpreter training (i.e., the 2nd month and end of the 3rd academic year, coded as Time 1 and Time 2). There were tests of CI in the B-A and A-B directions, tests of language skills (English proficiency, comprehension of source language, summary writing for source language), different measures of WM span (listening, reading and speaking spans in both languages, digit and spatial spans), cognitive control tasks (number Stroop task and flanker task) and measurements of interpreting anxiety.

The main findings were: 1) At Time 1, none of the tests was correlated with interpreting performance; 2) At Time 2, in the A-B interpreting direction, only one test (i.e. interpreting anxiety) was significantly correlated with interpreting performance; 3) At Time 2, in the B-A interpreting direction, there were six tests that were significantly correlated with interpreting performance: source language (English) summary, source language comprehension, English proficiency, interpreting anxiety, English listening span, and Chinese speaking span.

The contrast between Time 1 and Time 2 on the one hand and that between the two directions at Time 2 on the other hand point to an important conclusion: The most important function for this first year's interpreter training for students of interpreting is probably that it helps coordinate trainees' componential capabilities. In other words, it was through the complex task of interpreter training that trainees' relevant capabilities were coordinated. At Time 1, when the trainees had hardly received any interpreter training, those relevant skills had not established any connection with interpreting performance, while at Time 2, in the B-A direction that had been practiced most in the past academic year, these skills were coordinated in the task of interpreting, leading to a significant relationship between the two. Interpreter

training is perhaps a process to learn to coordinate one's relevant capabilities in the process of the demanding task of interpreting.

To further explore the relationship between relevant skills and interpreting performance in these students of interpreting, we built a structural model (using the statistics tool AMOS) with data from the B-A direction at Time 2. The six tests that correlated with interpreting performance can be categorized into two factors: language competence (source language summary, source language comprehension, and English proficiency) and psychological competence (interpreting anxiety, English listening span, and Chinese speaking span). Based on the correlations between the interpreting scores and the six test scores, a valid structural equation model was established (see Figure 1). Altogether, the results indicate that, for students of interpreting, both language skills and psychological competence are important for B-A CI performance, and that psychological competence is especially important because language skills mostly function through the mediation of psychological competence.

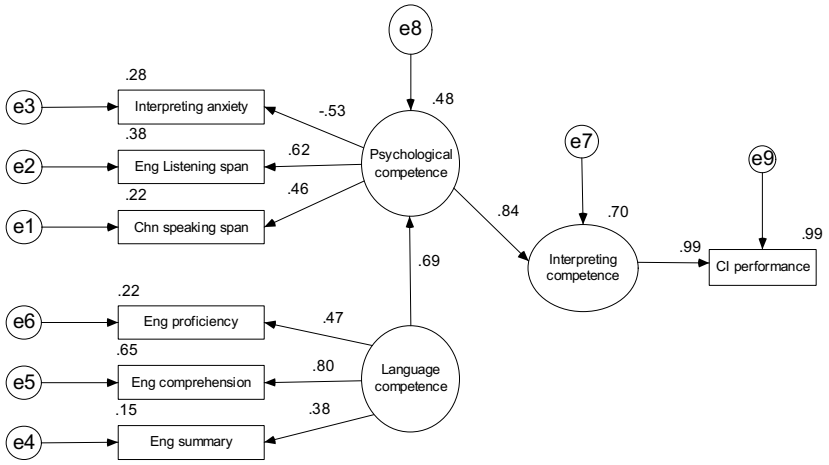

Figure 1 Structural equation model for English–Chinese consecutive interpreting (Dong *et al.* 2013)

This empirical study has rich implications for interpreter training. The first implication is about interpreting anxiety, which was the only test that correlated with interpreting performance in both interpreting directions. More importantly, it was interpreting anxiety rather than trait anxiety that was related to interpreting performance although the two kinds of anxiety were highly correlated. In other words, it was not the personal trait of being anxious easily that was related to interpreting performance. Rather, it was the interpreting task-related or the interpreting situation-related anxiety that led to poorer performance. One possible explanation is that trainees became anxious because interpreting was a relatively novel and demanding task. This anxiety may result in poorer performance, which in turn may build up more interpreting anxiety. To break this vicious circle, more efforts by instructors are needed. Building up trainees' confidence and helping trainees handle their anxiety are important in interpreter training.

A second implication concerns WM in interpreting. Since it is generally agreed that WM plays an important role in the success of consecutive interpreting (e.g., Gile 1997/2002), WM training has become an important part in many training programs. One common practice for these programs is to ask trainees to memorize and repeat back digits in order to promote students' memory skills. However, according to the results in Dong *et al.* (2013), this practice is probably not sufficient for memory training because digit span was not found to have a significant relationship with CI performance. What was related to interpreting performance was the two measures of verbal WM span, i.e., English listening span and Chinese speaking span. The difference is that verbal WM involves language processing and storage. It may, therefore, produce better results if students' memory for listening and speaking were trained directly.

4.4. Motivational system of interpreting learning

Based on quantitative and qualitative data collected from student interpreters in five representative universities in South China (including *Guangwai*), Zhiwei Wu (an instructor of interpreting at *Guangwai*) constructed a motivational system of interpreting learning (Wu 2015). This system is characterized by three phases and five stages: Phase I (excitement stage), Phase II (disorientation stage and/or apathy stage) and Phase III (hatred stage or stability stage). At the very beginning of interpreter training, students were confident and full of excitement and expectations. But later when they started to encounter difficulties, such as poor performance in class and little progress in training, they started to lose their confidence. They might feel quite disoriented and did not know what to do. Or they might feel quite apathetic and started to rely on their teachers, classes and classmates. After this second phase, they either overcame their weaknesses and started to pick up confidence and positive feelings, or became worse and started to hate their classes and vowed not to do any interpreting work in the future.

There are more specific interesting findings in Wu (2015). First, the learning motivation of those who had received interpreter training for 3 months or less was mainly affected by their confidence. In contrast, the learning motivation of those who had received interpreter training for more than 3 months was mainly affected by their positive emotions to interpreter training. Second, the analysis of responses to questionnaires indicates that students from different universities, with different L2 proficiency and different goals, differed in their motivation to learn interpreting. For example, students from a certain university that is considered one of the best universities in China had the highest motivation. Students who scored better in the national

English proficiency test of TEM4 were significantly more motivated than those who did not do well.

In short, as Wu (2015) indicates, students' motivations to study interpreting fluctuated a lot in the first one or two years, which is definitely closely related to the students' experience with their social context (including factors like the prospect of a career in interpreting), learning context (including teachers, classes and classmates) and other psychological factors like confidence, etc. To train these students, one has to monitor their level of motivation so as to maintain it or raise it. Wu (2015) has provided a framework with specific indexes for monitoring trainees' motivation.

5. Suggestions for interpreter training and for future research

The present paper advocates empirical research about students of interpreting, especially undergraduate students of interpreting, and summarizes the main results of three empirical studies on individual differences in students of interpreting at *Guangwai*. The main findings were: 1) L2 proficiency plays an important role in interpreting competence development; 2) Interpreting anxiety (rather than trait anxiety) affects interpreting performance and the development of interpreting competence; 3) Students' motivation to study interpreting was affected by many factors and fluctuated a lot in the first one or two years. We believe that these three factors do not function independently. Rather, they interact with each other and work together to influence the development of interpreting competence in students of interpreting. Based on these findings, we make some

suggestions for interpreter training.

As mentioned earlier, our results indicate that the training offered by *Guangwai* was effective since the trainees did make significant progress in their first year. Still, improvement can be made to increase training efficiency, especially in curriculum design. If individual differences between students are taken more seriously in curriculum design, interpreter training would be more efficient and learner-friendly, rather than frustrating. Our first suggestion is about L2 proficiency enhancement courses. It is true that the majority of the T & I programs in China incorporate some components of L2 learning exercises. The problem is that most of these exercises are compulsory for all students. However, as our studies indicate, there are large variations in L2 proficiency. Therefore, it may benefit the learners more if learners can choose L2 courses that best fit their needs.

Our second suggestion concerns psychological factors. Students of interpreting will benefit tremendously if they can gain some knowledge and practical advice about anxiety and stress management during their orientation period. Therefore, it is recommended that anxiety management skills should be included in an introductory course to interpreter training. As for motivations, since they fluctuate in the process, instructors should pay close attention to trainees' spirit and promote their confidence when necessary.

There is more research work to be done. Empirical research about students of interpreting at the undergraduate level is important but is still at its early stage. In the future, psycholinguists and instructors can work together to further this line of inquiry. One issue that needs more research is interpreting strategies. How do students of interpreting use and develop interpreting strategies? Is the answer to this question related to factors such as L2 proficiency, WM, anxiety or motivation?

Another issue concerns the potential of the 'whole-person' T & I education (for a similar call from a different perspective, see Tan 2008). Since the task of interpreting is cognitively demanding, and since many factors (cognitive and psychological) are involved, it is important to treat the student of interpreting as a whole person who may be anxious and emotional in difficult situations. But more research is certainly needed to substantiate such a whole-person education system, especially research about individual differences in students of interpreting.

A related issue concerns the cognitive outcomes of interpreter training. There has been research indicating that interpreter training can bring about cognitive advantages in mental set shifting (Yudes, Macizo and Bajo 2011; Dong and Xie 2014). That is, interpreters are better at tasks which involve switching due to their language switching experience in interpreter training. But the interpreters in these two previous studies had received training in both oral interpreting and written translation when they were tested. So it is not clear what has brought the advantage in mental set shifting. If it is interpreter training rather than translation training that has brought this advantage (as indicated by our preliminary results), more research is needed to test the similarities and differences between these two modes of training, which will then help enhance training efficiency if these two modes of training are properly arranged in T & I curricula.

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