



The International Journal for
Translation & Interpreting
Research
trans-int.org

Student interpreters' strategies in dealing with unfamiliar words in sight translation

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DOI: 10.12807/ti.114201.2022.a03

Abstract: This research investigated student interpreters' strategies in dealing with unfamiliar words in the source texts during English-to-Mandarin (B-to-A) sight translation. The study examined and compared different strategies adopted by 10 first-year beginner student interpreters who had not yet attained NAATI Professional Interpreter accreditation and 10 advanced student interpreters who, after studying for a year and a half, had achieved a credential as NAATI Professional Interpreter in Australia. The data collection involved an English vocabulary test, three English-to-Mandarin sight translation tasks and retrospective interviews. Results showed that both groups of student interpreters tended to omit the unfamiliar English words. The advanced student interpreters made more strategic omissions of unfamiliar words in the source texts than the beginner student interpreters, whose work showed more passive involuntary omissions of unfamiliar English words than that of the advanced student interpreters. Both groups also made attempts to infer the meaning of unfamiliar words. The predominant types of inference strategies were based on participants' experience, reading-based contextual knowledge and collocation knowledge. As there has been little research on sight translation, this small-scale empirical study attempts to bridge this gap and inspire other researchers to further explore this area by carrying out larger-scale projects.

Keywords: Sight translation; unfamiliar words; omission; inference

1. Introduction

As an important interpreting mode, sight translation is widely used in both professional settings and interpreter education. Often regarded a hybrid between translating and interpreting (see Agrifoglio, 2004; Chmiel & Mazur, 2013; Dragsted & Hansen, 2009), "sight translation" (ST) in this paper refers to an oral translation of a written text, where the interpreter, with or without preparation time to read the source text, reads and analyzes the written source text and at the same time orally renders source messages in the target language.

ST is frequently used in Australia and many other immigration countries when written documents need to be accessed on the spot by users of another language during community interpreting assignments, such as interpreter-mediated police interviews, court procedures, business meetings and medical consultations. Such needs in the community settings of the translation and interpreting industry are also reflected by national certification exams

developed by the certifying bodies of some major markets such as the United States and Australia (see Hlavac, 2013), with ST tasks being important parts of these exams.

ST is also an important component in many interpreting training programs around the world (see Lee, 2012; Li, 2014). ST is deemed an effective exercise to improve student interpreters' speed in transferring messages from one language to another, enhance their ability to use a non-linear method to read a text and identify key information, and develop their oral delivery skills (Čeňková, 2015; Lee, 2012). In some translation and interpreting training programs, ST is taught as a distinctive skill that meets a real demand in the community translation and interpreting industry. ST is also a crucial exercise bridging consecutive interpreting training and simultaneous interpreting training (e.g., Moser-Mercer, 1994; Song, 2010).

Nevertheless, there has been a dearth of research on ST. Compared with the scholarly work on other translation and interpreting modes, there have been few empirical studies on ST (such as Agrifoglio, 2004; Chmiel & Mazur, 2013; Lee, 2012; Su & Li, 2019). As indicated by many researchers (e.g., Agrifoglio, 2004; Angelelli, 1999; Čeňková, 2015; Li, 2014), there is a dire need for more studies on ST. Previous studies on ST have mainly focused on topics such as (i) cognitive efforts involved in ST as opposed to simultaneous or consecutive interpreting or written translation (e.g., Agrifoglio, 2004; Shreve, Lacruz & Angelone, 2010), (ii) the impact of visual interference (due to the continued presence of the source text) on interpreters' ST performance (e.g., Agrifoglio, 2004), and (iii) interpreters' reading behavior during ST (e.g., Su & Li, 2019).

In an eye-tracking experiment, Su and Li (2019) found that low frequency words were a common problem trigger in ST between English and Chinese, and interpreters had longer fixation duration on difficult words, indicating an increased cognitive load. In the case of ST from an interpreter's B language into A language (i.e., from a non-native language to a native language), this could pose a challenge if the interpreter encounters an unfamiliar word in their B language. However, little research has explored how interpreters deal with unfamiliar words in ST in this direction, as it is usually assumed that interpreters should be competent in their working languages.

In reality, however, not all interpreters, especially in the case of student interpreters, have a sufficient command of their B language. In a survey of interpreting educators and examiners in Australia, Hale et al. (2012) found that B language proficiency was still one of the major concerns that educators had about their trainee interpreters (Hale et al., 2012). In fact, according to the first author's informal survey of her past and current postgraduate-level student interpreters, dealing with unfamiliar words in one's B language is perceived by the student interpreters as a major challenge in B-to-A ST tasks. Based on the report prepared by Hale and her team (Hale et al., 2012), in 2018, the National Accreditation Authority for Translators and Interpreters (NAATI) in Australia reformed its old accreditation system and established an English language proficiency screening mechanism in its new certification system. For example, in demonstrating competency in English, a candidate needs to achieve 7.0 in IELTS test or another equivalent test to be able to sit for the Certified Interpreter test¹. To non-native English speakers, an English proficiency at this level

¹ For detailed information about NAATI's Certified Interpreter Test, please visit <https://www.naati.com.au/become-certified/certification/certified-interpreter>. For further information regarding NAATI's English proficiency requirements, please visit <https://www.naati.com.au/become-certified/how-do-i-become-certified/english-proficiency/>.

(scoring 7.0 in IELTS) means they are still likely to encounter unfamiliar words in English texts (Drummond, 2018). Furthermore, when ST tasks take place in work situations or during interpreting exams (e.g., NAATI's Certified Interpreter Test), professional interpreters and student interpreters hardly get a chance to look up unfamiliar words in dictionaries or online, due to the 'real time' nature and immediate use of ST or because dictionaries are not allowed in those exams. Therefore, dealing with unfamiliar words in ST is an important and practical skill for both student interpreters and professional interpreters.

The aim of this innovative, mixed methods study is to investigate how students with different durations of interpreting training deal with unfamiliar words in the source texts of English-to-Mandarin (B-to-A) ST tasks in real time, without the assistance of dictionaries or online resources. To contextualize the research design of this study, an overview of the relevant literature is presented below.

2. Literature review

Most of previous studies on ST focus on the cognitive process of ST in comparison with that of simultaneous interpreting, simultaneous interpreting with texts, consecutive interpreting, and written translation. For example, Viezzi (1989) compared both student interpreters and professional interpreters' information retention rates after ST and simultaneous interpreting. He found that, when taken as a whole, participants' information retention rates after ST were lower than those after simultaneous interpreting. He explained that it was because information processing in ST is not as deep as that in simultaneous interpreting. Viezzi also found that participants' information retention rates after ST of syntactically similar languages were higher than those after ST of syntactically different languages, indicating that the degree of syntactical similarity between the source language and the target language may influence memory load in ST. Lambert (2004) compared 14 student interpreters' performances on ST, sight interpretation (also known as "simultaneous interpretation with text") and simultaneous interpreting (all three tasks from French into English, i.e., B-to-A), and found that participants performed better on both ST and sight interpretation than on simultaneous interpreting. Lambert's results indicate that, due to the visual presence of the source text, ST causes less cognitive and memory load than simultaneous interpreting.

Four studies (Chmiel & Mazur, 2013; Dragsted & Hansen, 2009; Jakobsen & Jensen, 2009; Shreve et al., 2010) have used eye-tracking technology to offer insights into the cognitive process of ST, written translation and reading comprehension. Dragsted and Hansen (2009) asked four professional interpreters to do a ST task and four professional translators to do both ST and written translation tasks, all of which were performed from English into Danish (B-to-A for all participants). They found that participants' ST was not only considerably more time-efficient but also substantially more accurate than written translation. Jakobsen and Jensen (2009) compared professional translators' and student translators' eye movement patterns in reading for four different purposes: (i) reading for comprehension, (ii) reading with an aim to translate the text later, (iii) ST, and (iv) written translation. They found that, based on the eye-tracking data collected, reading for ST was more cognitively demanding than reading for comprehension and reading for the purpose of later

translating the text later. They also found that, as expected, in ST, the professional translators read the source text faster than the student translators, indicating that with practice ST becomes less cognitively demanding.

In addition, using eye-tracking technology, Shreve et al. (2010) compared students' ST and written translation (both tasks from Spanish to English, B-to-A for all participants but one) in terms of the cognitive effort for dealing with sentences of different levels of syntactic complexity. They found that, in ST, source language sentences with complex syntax required more processing efforts than sentences with non-complex syntax. Their results indicate ST is extraordinarily sensitive to visual interference due to the constant presence of the source text. Their results also indicate that ST is a cognitively complex task, because it requires interpreters to cope with both the high lexical density and syntactical complexity of a written source text while ensuring the smooth delivery of a target language speech. It is worth noting that the focus of these studies was on the cognitive effort involved in ST and other tasks (e.g., written translation, reading comprehension), rather than only on ST.

In Chmiel and Mazur's (2013) eye-tracking study of ST, the researchers compared two groups of student interpreters, with one-year difference in the length of interpreting training, in sight translating a manipulated text from Polish (A language) into English (B language). The researchers aimed to explore if the duration of interpreting training had any significant impact on participants' ST skill development and reading patterns, and if syntactic and lexical challenges presented the greatest difficulties for the trainees. Their results indicate that one-year difference in interpreting training did not have any significant impact on trainee interpreters' ST skill development. However, Chmiel and Mazur's study is pioneering in that it constitutes a new trek in empirical research of ST by focusing on specific challenges in the cognitive process (in their case, the syntactic and lexical complexities, sentence readability), rather than on the overall cognitive load. More recently, also using eye-tracking technology, Su and Li (2019) investigated problems in ST between English and Chinese. They found that interpreters experienced different problems in B-to-A and A-to-B ST. Another finding that is more relevant to the current paper is that low frequency words were identified as a common challenge in ST of both language directions (Su & Li, 2019).

Apart from the cognitive research into ST, Gile's Effort Model of ST (Gile, 2009) has inspired some researchers to conduct research on ST. Gile (2009, p. 179) models ST as "Reading Effort + Memory Effort + Speech Production Effort + Coordination". As indicated by this model, a good performance of ST relies on a combination of multiple factors, including an interpreter's good command of both A and B languages to facilitate both reading comprehension of the source text and speech production in the target language.

Inspired by Gile's model for ST (Gile, 1997), Agrifoglio (2004) compared the performance of six professional interpreters in ST, simultaneous interpreting and consecutive interpreting, all of which were performed from English into Spanish (B-to-A). Agrifoglio's findings suggest that in ST, source text interference (mainly because the source text remained visible throughout the task) seemed to be the greatest obstacle for the professional interpreters who had at least nine years of professional experience, affecting both their target language expression and their coordination of silent reading and oral translating. The professional interpreters appeared to have suffered from coordination problems and short-term memory failures in ST, as they often lost the referent and forgot the gender, number and person (Agrifoglio 2004, pp. 52-53).

Interestingly, Agrifoglio's findings regarding professional interpreters do not seem to corroborate Ivars's (2008) and Lee's (2012) findings regarding student interpreters. In a survey study of 22 student interpreters, Ivars (2008) found that the students considered source text comprehension as the primary cause of translation problems in ST, and searching for target language equivalents as the second major cause of challenges. Ivars's results are partly supported by Lee's (2012) findings. Lee (2012) compared six student interpreters and three professional interpreters in terms of their English-to-Korean ST performance, which was assessed in terms of accuracy, target language expression and delivery qualities. Lee found that most of the student interpreters encountered reading comprehension problems that led to accuracy-related mistakes. In contrast, the three professional interpreters in Lee's study did not have many source text comprehension problems. She found that the students need to improve their English reading skills to not only accurately understand the source text, but also distinguish key ideas from secondary ones. She also found that condensation strategy (i.e., lexical and syntactic compression and omission, strategic information reduction, preserving key ideas while leaving out redundant information and using concise expressions in the target language), only used by the most experienced interpreter in the study, was an effective method to improve both delivery and target language qualities. The review above appears to show a mismatch in the findings between the studies of professional interpreters and student interpreters in terms of the primary challenges during ST. It is important to note that, in Ivars's (2008) and Lee's (2012) studies, the student interpreters conducted ST from their B language into their A language, indicating that the interpreters' B language proficiency might play a role in causing the comprehension problems.

Gile (2009) also acknowledges that many student interpreters fail their final professional examinations because of insufficient command of their working languages, not because of insufficient interpreting skills or cognitive skills. As Gile has pointed out, the theoretical consensus is that, at the time of admission into an interpreting training program, students should already have a "near-perfect" command of their working languages. However, it is a fact of life that the students' (or even the professional interpreters') knowledge of their non-native working language (B language) is sometimes deficient (Gile 2009, p.221). Students' and/or practitioners' inadequate command of their working languages, especially their B language, means that they are likely to encounter difficulties in translation and interpreting training and/or real-life work.

Against this backdrop, the current study aims to explore one of the key factors that causes source language reading comprehension problems in B-to-A ST: interpreters' limited vocabulary in their B language. This study specifically focuses on one single issue in relation to vocabulary – unfamiliar words in the source text in student interpreters' B language. Although studies on reading comprehension have widely identified vocabulary knowledge as an important factor influencing readers' reading speed and comprehension (e.g., Hu & Nation, 2000; Nation & Coady, 1988; Qian, 2002), most of these studies have concentrated on English as a Second Language (ESL) learners only, rather than translation and interpreting students. In exploring readers' inference skills, previous research (e.g., Cain & Oakhill, 1999; 2001; Elbro & Buch-Iversen, 2013) also mainly aims to better understand reading comprehension. Little research has investigated how student interpreters or newly qualified interpreters cope with unfamiliar words in a B language source text during B-to-A ST. Thus, the present study, exploring strategies utilized by student interpreters at different training stages to deal with unfamiliar words during B-

to-A ST tasks, is timely and of pedagogical implications. Specifically, this study aims to explore the following three research questions:

1. What strategies are generally employed by student interpreters in dealing with unfamiliar words during B-to-A ST?
2. In dealing with unfamiliar words during B-to-A ST, do student interpreters at different training stages use generally different strategies?
3. In terms of maintaining accuracy, how effective are these strategies in addressing unfamiliar words during B-to-A ST?

3. Method

To address the research questions, two groups of student interpreters were recruited, including a beginner student group and an advanced student group. Data collection with each participant took place individually. In each session, participants went through the same procedure, which included an English vocabulary test, three English-to-Mandarin ST tasks, a retrospective interview immediately after each ST task, and a short break after each retrospective interview.

3.1 Participants

A total of 20 Mandarin/English postgraduate student interpreters were recruited, and then were divided into two groups based on the length of their interpreting training at an Australian university. All participants had Mandarin as their native language (A language) and English their non-native language (B language). Group A consisted of 10 beginner student interpreters who had started Mandarin/English interpreting training two and a half months before the data collection, and had not yet obtained any professional interpreter credentials. Group B included 10 advanced student interpreters who had completed one and a half years of postgraduate level interpreting training. At the time of data collection, Group B participants just obtained NAATI Professional Interpreter credential by successfully passing an internal Professional Interpreter accreditation test² that was administered at the end of their studies in the Master of Translation and Interpreting Studies program, and they successfully transitioned to the first semester of a Master of Conference Interpreting program. It is important to note that, although the participants in Group B received the NAATI Professional Interpreter credential, they had only limited professional experience following their accreditation and graduation from the Master of Translation and Interpreting Studies program, because they immediately moved on to study in the Master of Conference Interpreting program. Therefore, the authors believe that it may be more appropriate to label them as “advanced student interpreters” than “professional interpreters” in this study. Apart from training background, another recruitment criterion was the participants’ English proficiency: participants in both groups had achieved 7.0 or above in their most recent IELTS reading test. Gender and age were not selection criteria in this project. A human research ethics approval had been

² At the time of the data collection, it was still possible for a student interpreter to obtain NAATI accreditation through internal tests organized by an endorsed translation and interpreting program. In the 2018 reform of NAATI’s testing system, “accreditation” was replaced by “certification”, and all candidates must now sit certification tests directly delivered by NAATI. See further details at <https://www.naati.com.au/>.

obtained from the authors' institution before the data collection started, with all participants giving consent to the researchers to collect their data.

3.2 Texts for ST and vocabulary check

Altogether three English texts were used for the English-to-Mandarin (B-to-A) ST tasks. Each text covers a different topic domain. The texts, selected from the Internet, are all “know-how” texts intended for giving advice to laypersons. Table 1 presents basic information about the texts.

Table 1. The three source texts for ST from English into Mandarin

English Source Texts	Title	Topic domain	Word count
Text One	How to avoid acne	The text gives common skin care advice.	265
Text Two	How to take your baby's temperature with a rectal thermometer	The text provides baby nursing advice.	330
Text Three	How to apply for parole	The text introduces conditions for parole application.	265

A Flesch Reading Ease test was conducted, and all three texts scored between 50 and 70, indicating they are standard in terms of readability (Flesch, 1948). As the focus of the current paper is on lexical items, a lexical sophistication test was also conducted to check the average frequency of the words used in the three texts compared to all English words in general. To achieve this, TAALES, a computational tool using various indices to test lexical complexity, was used (Kyle & Crossley, 2014). The average word frequency of each text was calculated based on the mean frequency score of all words used in two large corpora: the British National Corpus (BNC) written texts and the Corpus of Contemporary American English (COCA) academic texts. The frequency test results are presented in Table 2:

Table 2. Average word frequency of the texts

	Text One	Text Two	Text Three	Index description
BNC_Written_Freq_AW	6.4	6.8	7.3	Mean frequency score of all words in text, based on British National Corpus, written; frequency per million words
COCA_Academic_Freq_log_AW	2.5	2.5	2.8	Mean frequency score of all words in text, based on the Corpus of Contemporary American English, academic; log-transformed

As Table 2 indicates, there is not much difference among the three texts in terms of word frequency, and on average, words in all the three texts are in the low frequency range in general (see Brysbaert et al., 2018).

Although word frequency has been found to be related to word familiarity (e.g., Tanaka-Ishii & Terada, 2011), language users' familiarity with words is subjective, and the magnitude of the word frequency effect varies with an individual's vocabulary size (Kuperman & Van Dyke, 2013). Therefore, it is important to first identify the words of interest for further analysis: they are the words that are potentially challenging to the participants during ST. For this purpose, prior to the data collection, a trial was conducted on two volunteer interpreters (they were not counted as "participants" in the project). The purpose of the trial was to identify a list of potentially 'difficult' words that could be further examined later in the ST tasks. In the trial, the two volunteers, who shared the same language background and English proficiency level as the 20 participants, were asked to sight translate the three English texts into Mandarin and to identify words that they were not familiar with during the ST. The two volunteers were encouraged to identify any words that they were uncertain about. As a result of the trial, a list of words was compiled. Later, in the ST experiment, the word list was used in an English vocabulary test for all participants. In the vocabulary test, participants were asked to assign the listed words to three categories: "known", "unknown" and "uncertain". If a word was identified as "known", participants needed to write down its meaning in either English or Chinese. The categorization of the words was based on Gile's (2009) Gravitational Model of language availability, where the "known" category represents those words which can be retrieved instantaneously from the interpreter's long-term memory, and the "uncertain" category represents those which are passively available in the long-term memory but cannot be retrieved at the moment of the vocabulary test, and the "unknown" category represents those which are not stored at all in the interpreter's long-term memory. In the vocabulary test, the words were presented in a list without any contextual information provided. In the case of polysemous words, participants only need to give one of the possible meanings.

It should be noted that some data was excluded from data analysis later. For example, from the results of the vocabulary test as well as the ST tasks which followed, the researchers noticed inconsistencies in some of the data collected: some participants had identified an English word as "known" but gave an inaccurate explanation, which indicates that the participants did not have correct knowledge about the word. As the focus of this research was on interpreters' strategies in dealing with words that they were knowingly unfamiliar with, such data was treated as invalid and was excluded from the analysis. It should also be noted that the boundary between "unknown" and "uncertain" was in fact not clear-cut, and the categorization was to help participants identify all the words that they were not familiar with on the list. In other words, the unfamiliar words to each participant were determined through their identification of "unknown" and "uncertain" words on the vocabulary list, as words in both categories represent meanings that were unfamiliar to the participants, which would pose challenges in the ST tasks and would require some coping strategies. The data analysis of this study therefore mainly concentrated on words in the "unknown" and "uncertain" categories, and the category of "known" words was not the focus in this paper.

3.3 ST tasks

After the English vocabulary test, participants were given the three English texts for ST into Mandarin (i.e., from their B language into their A language). Participants were given three minutes to read each text before ST. When the ST task started, the researchers took special note of the participant's oral translation

of those words being included in the previous English vocabulary test. The participants' specific handling of those English words that they described as "unknown" and "uncertain" was noted down and highlighted by the researchers for retrospective interviews later. It is important to note that only translation units involving those words in the English vocabulary test were highlighted, as the focus of this research was on participants' handling of those words in the ST. Participants' ST performance was audio-recorded during the experiment and was later transcribed after the data collection was completed.

3.4 Retrospective interview

An interview took place immediately after each ST task. During the interview, some semi-structured questions were asked focusing on each unfamiliar English word that had been highlighted during the ST task. As mentioned earlier, this article concentrates on the English-to-Mandarin ST of English words in the "unknown" and "uncertain" categories. The sample formats of the interview questions focusing on these two categories are presented in Table 3:

Table 3. Interview questions eliciting more information about how participants dealt with English words in the source texts described as "unknown" and "uncertain"

Category	Sample questions
Question about "unknown" English words	In the English vocabulary test, you identified the word "x" as "unknown". Then in this sentence/paragraph, you have translated it as "y". How did you work this out? In the vocabulary test, you identified the word "x" as "unknown". Then in this sentence/paragraph, you have left it untranslated. Why?
Question about English words described as "uncertain"	In the vocabulary test, you described the word "x" as "uncertain". Then in this sentence/paragraph, you have translated it as "y". How did you work this out? In the vocabulary test, you describe the word "x" as "uncertain". Then in this sentence/paragraph, you have left it untranslated. Why?

Participants' answers to these questions were both noted down and audio recorded. Where necessary, participants were asked to provide further explanations. By using these semi-structured "how" and "why" retrospective questions, the researchers aimed to encourage participants to reflect upon their decision-making process during the ST tasks.

3.5 Data analysis

Two researchers were involved in the data analysis. The researchers identified the participants' strategies in dealing with the highlighted "unknown" and "uncertain" words during the English-to-Mandarin ST tasks based on their explanations provided during the qualitative interviews. Following the analysis of the retrospective interviews, a taxonomy of different strategies being employed by participants was developed, and coding of data was completed according to the taxonomy (see Section 4 for details). Quantitative data was generated by counting the number of cases in each type of strategies to cope with the "unknown" and "uncertain" English words in the ST tasks. To maintain the reliability of the analysis, coding was completed by the two investigators independently, followed by an inter-rater reliability test using Cohen's (1960) kappa and the results indicate a satisfactory agreement ($\kappa=0.79$). A cross-check was also conducted later, based on which controversial cases were further discussed until a consensus was reached.

To assess the level of accuracy being achieved in the handling of the unfamiliar words, participants' ST performance was first informally assessed by the researchers during the retrospective interviews. Results of the informal assessment served as the foundation for some of the semi-structured questions in these post-task interviews. Following the experiment, the recorded ST performance was formally assessed by the two investigators independently. Before the independent marking took place, a group marking of a few recordings was completed by the two investigators together to maintain consistency. The assessment focused on how acceptable the Mandarin renditions of the unknown/uncertain English words were when evaluated at sentence level (see details in section 4.3). An inter-rater reliability of marking was conducted using Cohen's (1960) kappa and the results indicated a satisfactory agreement ($\kappa= 0.92$).

4. Results and discussion

This section presents results from both the qualitative and quantitative data. Section 4.1 focuses on the first research question: the strategies generally employed by student interpreters in dealing with unfamiliar English words during the English-to-Mandarin ST tasks. Sections 4.2 and 4.3 address the second and the third research questions, respectively: whether there is group difference in using the strategies; and how effective the strategies are in achieving accuracy in sight translating the unfamiliar English words.

4.1 Strategies in dealing with unfamiliar words

Based on the data analysis, in general, the strategies adopted in dealing with unfamiliar words are found to fall into two categories: participants (i) either omitted the "unknown/uncertain" English words during English-to-Mandarin ST (ii) or translated these words, accurately or inaccurately, after inferring the meanings through various clues. In this paper, the authors named the former strategy "omission" and the latter "inference". Based on participants' answers to the interview questions, these two strategies were further categorized (see Table 4).

Table 4. A taxonomy of sight translators' strategies in dealing with "unknown" and "uncertain" words

Strategies	Sub-types
Omission	Strategic omission
	Passive omission
Inference	Experiential knowledge-based inference
	Contextual knowledge-based inference
	Generalized inference
	Collocation-based inference
	Morphological knowledge-based inference

Figure 1 presents a general picture of using omission and inference by the two groups. As the figure shows, generally omission was less frequently used than inference and this situation applies to both Group A and Group B.

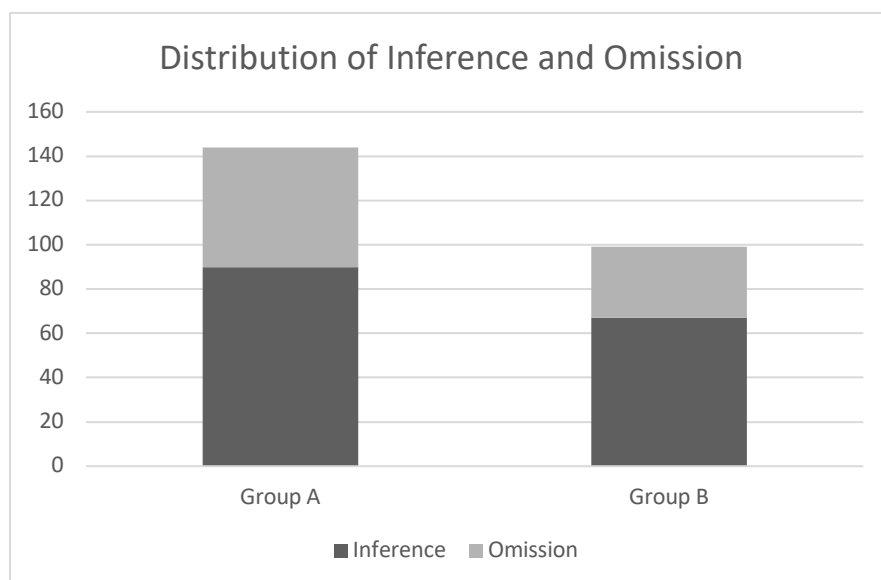


Figure 1. Inference and omission by two groups

4.1.1 Omission

We used the term “omission” to indicate instances where an interpreter left out an “unknown” or “uncertain” word in the source text. Drawing on Napier’s (2004) taxonomy of omissions in interpreting, the researchers identified two types of omissions in the ST data. The first type of omission in the ST data is “strategic” omission, where the interpreter intentionally omits a word (or words) without causing a loss of meaningful information. The concept “strategic” omission is similar to Napier’s (2004, p. 125) definition of “conscious strategic omission” as “omissions made consciously by an interpreter, whereby a decision is made to omit information in order to enhance the effectiveness of the interpretation”. The second type of omission in the ST data is “passive” omission, where the interpreter is conscious of the omission and has opted for it intentionally, due to a lack of comprehension of a particular lexical item (or a message) in the source text. The notion “passive” omission resembles Napier’s (2004, p. 125) definition of the “conscious intentional omissions” but interpreters often make such passive omissions unwillingly when they are aware of the consequence of meaning loss. It is important to clarify that, unlike what is described in Gile’s (2009) Tightrope Hypothesis², where an omission is caused by the interpreter’s processing-capacity limitations, a passive omission in this paper is mainly due to the interpreter’s insufficient lexical knowledge in either the source language or the target language.

In identifying strategic and passive omissions in this project, both the marking of participants’ ST performance and their retrospective interviews were analyzed. Where an omission was assessed as not causing loss of meaningful information, it was coded as ‘strategic’. In comparison, where an omission resulted in loss of coherence or loss of meaningful content, it was coded as ‘passive’. Participants’ self-explanations in the retrospective interviews were used as a useful reference in determining the type of omissions

² Gile’s (2009) Tightrope Hypothesis refers to an assumption that most of the time an interpreter works close to cognitive saturation and thus any challenge in the source text may trigger the interpreter to experience cognitive overload and make an error in the interpretation.

that they made. Apart from participants' own reflections, an additional helpful indicator in identifying a passive omission was a salient pause (usually longer than 2 seconds). The silent pause typically happened before an identified passive omission, indicating the time when the interpreter struggled to look for a solution to the problem, but without success. As some participants explained later, they "got stuck on the unknown word" and therefore "had to skip the translation of it". Essentially, such an omission is a reluctant but conscious decision which leads to poor accuracy in the target language output.

Based on the data collected from the ST experiments and from the retrospective interviews, the potential reasons behind a "strategic omission" seem to be more complex than those behind a "passive omission". It is found that the use of strategic omission was often based on the interpreter's weighing of the meaning value of the English word in the source text as well as the risk of making a mistake in the target language output. In other words, the interpreter decided to leave out the "unknown/uncertain" English word due to two major concerns: on the one hand, the interpreter believed that the meaning represented by such an English word was not significant, so omitting it would not cause a serious accuracy problem; on the other hand, the interpreter realized that, due to their insufficient knowledge of this English word, an attempt to translate it may cause a translation error. Such a conscious decision-making process is demonstrated by a typical explanation given by a participant from Group B in this project when she was asked why she did not translate the word "rubbing" in the sentence of Text Two "To prepare the thermometer, clean the end with rubbing alcohol or a little soap and warm water":

I left it untranslated because I wasn't sure about the meaning here and I didn't want to make a mistake. Also, it's an adjective modifying "alcohol", so I guess it's okay if I translate "alcohol" only.

In another example, when explaining why he omitted "acne vulgaris" in translating the sentence "Common acne (aka "acne vulgaris") is a skin condition characterized by what are often called pimples or zits", a participant from Group B provided the following explanation:

I guess it probably means the same as "common acne", but I cannot think of another name for "acne" in Chinese. Anyway, it's something in the brackets, so I think it's fine to leave it out.

The quotes above indicate that the interpreters evaluated the meaning value of the "unknown" or "uncertain" words in the English source texts and compared the potential consequence of omitting them with the consequence of making a potential mistake. And in adopting the strategy of "strategic omission", those interpreters believed that it was "safer" to omit the words than to provide possibly inaccurate translations. Essentially, a "strategic omission" is an active strategy to avoid making an obvious mistake in the ST.

4.1.2 Inference

We used the term "inference" to refer to instances where an interpreter managed to guess the meaning of the "unknown" or "uncertain" English words on the basis of various types of textual and non-textual clues and worked out a translation of the "unknown" or "uncertain" words – such a translation could be either acceptable or unacceptable. Essentially, inference is an active strategy, though it carries a risk of leading to inaccuracy. When asked to explain, participants often used the word "guess", such as "I simply guessed the meaning

based on the text information”; “I made a wild guess based on the collocation”; and “I guess it means x because I had a similar experience in the past”. Obviously, participants relied on one or more types of knowledge to find a solution for the unfamiliar word. The following section uses some participants’ typical explanations from the retrospective interview to illustrate each type of inference.

Experiential knowledge-based inference:

We used the term “experiential knowledge-based inference” to refer to situations where interpreters used their general knowledge about the topic domain, which derived from their life experience or learning, to process the meaning of an “unknown” or “uncertain” word in the source text. This strategy is illustrated by the following remarks from a participant in Group A:

Background:

The participant indicated in the English vocabulary test that the word “puberty” was unknown to him. However, he accurately conveyed the meaning of this word in the relevant sentence, “Some factors, such as being in puberty, can’t be altered, but you can take steps to avoid and prevent acne.”.

Participant’s explanation:

I didn’t know the word in the first place. But in the text it says factors causing acne, such as “puberty”, cannot be altered, so I guess the word “puberty” must mean “青春期” (puberty) because I know age cannot be altered and I personally had acne when I was a teenager.

Contextual knowledge-based inference:

In our study, we used the term “contextual knowledge-based inference” to refer to situations where interpreters used the knowledge that they had gained from reading the source text, based on which they determined the meaning of an “unknown” or “uncertain” word. The contextual knowledge may derive from reading the whole text in general. Some useful contextual clues include: the overall purpose or the function of the text, the audience for which this text is written, and the subject matter of the text. Sometimes, contextual knowledge derives from the general understanding of a paragraph. An interpreter may use the contextual knowledge obtained from different levels (paragraph/sentence/clause/phrase) to help determine the meaning of an unfamiliar word. This strategy can be illustrated by the following comments from a participant in Group B:

Originally, I had no idea what “prescribed prisoner” meant. But after reading the following paragraph, I realized what the meaning was.

Sometimes, participants guessed the meaning of “unknown” or “uncertain” English words based on both the general and contextual knowledge that they had obtained through reading. An example is presented below:

Background:

A participant from Group B indicated in the English vocabulary test that she did not know the word “exfoliate”. However, she accurately rendered this word in different places in the first source text.

Participant’s explanation:

I didn’t know the word. But through reading, I knew the whole text was about looking after your skin, and in the last paragraph the advice was to exfoliate once a week.

After reading this, I realized immediately what this word meant because removing dead skin is a routine normally done once a week.

In this example, the participant used both her experiential knowledge about skin care and the contextual knowledge, including the subject matter of the whole text and the specific topic in the last paragraph, to work out the meaning of the “unknown” word.

Generalized inference

In our research, we used the term “generalized inference” to refer to instances where interpreters were unable to work out the precise meaning of an “unknown” or “uncertain” word, and instead used a word representing a more general class of the kind as the equivalent in the target language. The generalization strategy was usually based on a taxonomic or part-and-whole semantic relationship. An example is presented below:

Background:

The participant indicated in the English vocabulary test that she was “not sure” about the word “bulb”. Later in the following sentences in the source text, “Press the thermometer button to turn it on. Gently insert the bulb about three-quarters of an inch to an inch (2 to 2.5 centimeters) into her rectum.”, the participant rendered “bulb” as “温度计” (the thermometer), without specifying that it meant the bigger end of the thermometer.

Participant’s explanation:

I was not quite sure about the translation of “bulb” here, but I knew it referred to one end of the thermometer – I just couldn’t find a proper equivalent word in Chinese at that moment. So I decided to use “温度计” (the thermometer) to refer to it because it is a part of the thermometer anyway and the readers [listeners] should be able to figure it out.

As the example illustrates, the interpreter attempted to avoid an obvious mistake by using a general name (温度计 the thermometer) to refer to a specific part of the item (the bulb). This interpreter’s rendering of “bulb” as “温度计” (the thermometer) may adequately convey the pragmatic meaning to the listeners, but the specific and precise meaning of the English word has been generalized.

Similarly, in other examples of generalized inference, some interpreters used a general reference word in Chinese, such as 这个 (*this*) or 那个 (*that*), to refer to a specific thing that was originally represented by an English noun that was unfamiliar to the interpreters. Although generalized reference is identified as a coping strategy in the current paper, it is important to point out that such practice may not always be accepted as a positive strategy in addressing the problems caused by an unfamiliar word, as the solution is based on a dangerous assumption that the target audience is able to infer the delicate details of the meaning that are missing in the general reference.

Collocation-based inference

We used the term “collocation-based inference” to refer to a strategy with which an interpreter decided on a translation by observing the collocation between the unfamiliar word and the other words or elements that they had already known in the source text. Such collocation could be a lexical collocation where an “unknown” or “uncertain” word came together with a “known” word to form a group or phrase. Alternatively, it could be a syntactic collocation where an

“unknown” or “uncertain” word and a “known” word or phrase formed a syntactic relationship such as a Subject-Verb or Verb-Object structure. By observing the collocational relations between the familiar and the unfamiliar words, the interpreter determined the meaning of the unfamiliar word. An illustrating example is given below:

Background:

A participant from Group B indicated in the English vocabulary test that she did not know the words “slough” and “unclog”. Later in the following sentences in the English source text, “Exfoliating means gently wiping off the outer layer of the skin (called the epidermis) in order to help slough off dead skin and unclog pores”, the participant translated “slough off dead skin” as “去除死皮” (remove dead skin) and “unclog pores” as “打开毛孔” (open the pores).

Participant’s explanation:

Although I didn’t know the word “slough”, I noticed that it worked together with “off”, and “dead skin” was the Object in the sentence, so it’s easy to guess the meaning overall – what else can you do with the dead skin except “removing” it? ...You either “block” the pore or “open” it, and obviously here it is talking about a good effect, so that’s how I worked it out.

As the example above indicates, to use this strategy, an interpreter needs some experiential knowledge to process the collocational relationship between an unfamiliar word and the neighboring words that are already known.

Morphological knowledge-based inference

We used the term “morphological knowledge-based inference” to refer to instances where interpreters used their morphological knowledge to find out the meaning of unfamiliar words. Obviously, in such a case, the problematic word contains either a lexical morpheme (which carries meaning, such as *post-* or *pre-*) or a grammatical morpheme (which carries a grammatical function, such as *-ness*) that is already known by the interpreter. An interesting example is presented below:

Background:

A participant from Group A indicated in the English vocabulary test that she did not know the word “rectum”. Later in the following sentences in the English source text, “Press the thermometer button to turn it on. Gently insert the bulb about three-quarters of an inch to an inch (2 to 2.5 centimeters) into her rectum, or until the tip of the thermometer disappears.”, the participant translated “rectum” as “肛门” (anus).

Participant’s explanation:

After reading the text, I realized that “rectal thermometer” actually referred to that kind of thermometer to be used in one’s bottom. With this knowledge, when I saw the word “rectum”, which looks similar to “rectal”, I realized that it must be the noun form of the word.

In this example, the participant first used contextual knowledge to determine the meaning of “rectal thermometer”, and then used her morphological knowledge to infer the meaning of “rectum”. Strictly speaking, the inference in this example is based on both experiential knowledge and morphological knowledge of the interpreter.

4.2 Quantitative results regarding the use of strategies

To address the second research question, this section presents the quantitative data of each type of strategies used and compares the two groups of participants in terms of their use of these strategies. It is necessary to acknowledge that, although we aim to approach the question from a quantitative perspective, the statistical indication of these results is limited due to the small sample size in this project. The purpose of adopting a quantitative approach is to shed light on potential factors behind these results and orient to larger-scale projects in the future.

4.2.1 The use of omission

Figure 2 shows the frequency of using the different types of omissions by the two groups in dealing with “unknown” or “uncertain” words in sight translating the three source texts.

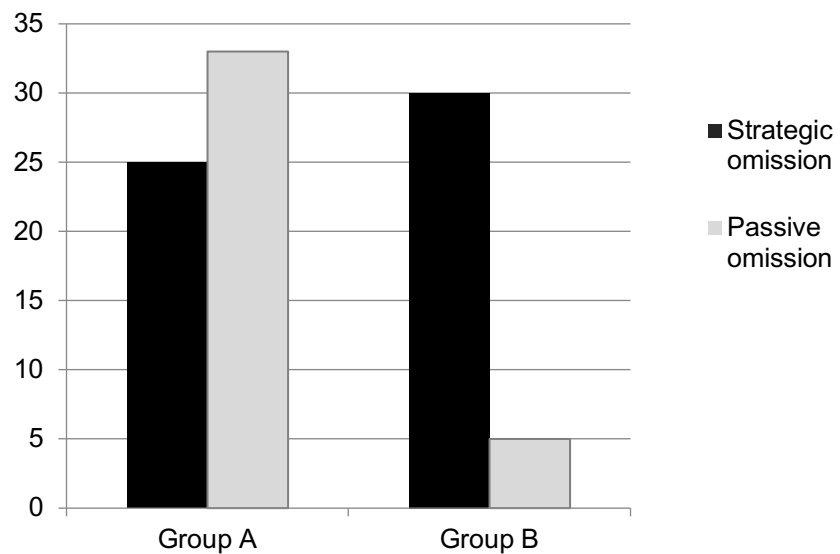


Figure 2. Participants' use of omissions

Figure 2 shows a remarkable difference in the use of omission between the two groups of participants when they encountered “unknown/uncertain” words. Overall, the first-year student interpreters in Group A used omission more frequently (58 times in total) than the advanced student interpreters in Group B (35 times in total). This result pattern is probably related to the fact that on average the first-year student interpreters encountered more “unknown” and “uncertain” words than the advanced student interpreters (19 vs. 15 on average), which led to more omissions in the former’s target language output.

In addition, the first-year student interpreters in Group A used more “passive omissions” than “strategic omissions” in the three ST tasks (33 vs. 25). By contrast, the advanced student interpreters in Group B used markedly more “strategic omissions” than “passive omissions” (30 vs. 5). These findings indicate that the advanced student interpreters were more active in responding to unfamiliar words, whereas the beginner student interpreters were more likely to flounder when in the same situation and thus “passive omission” happened as an ad hoc solution.

4.2.2 The use of inference

Figure 3 shows the use of different types of inference by both groups in coping with unfamiliar words in the ST.

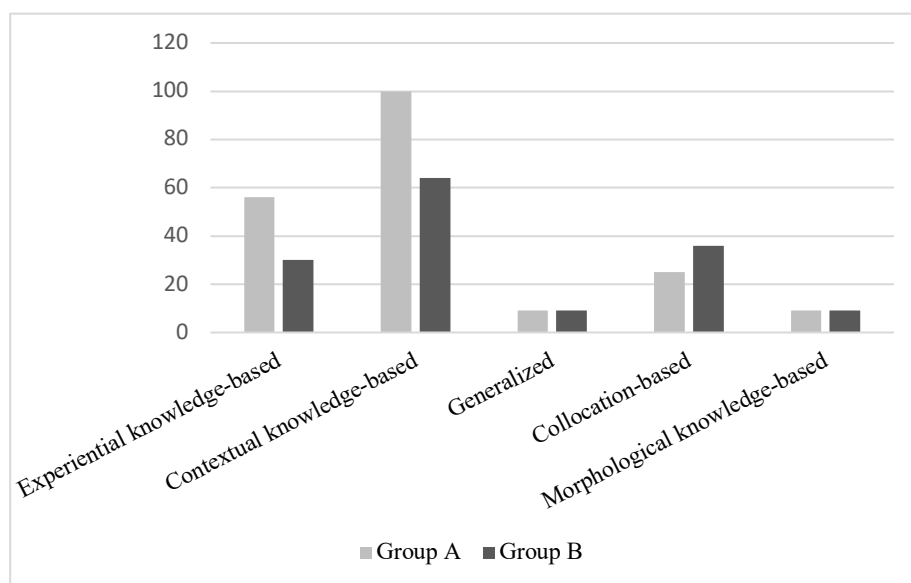


Figure 3. Participants' use of inference

As shown in Figure 3, the two groups of participants demonstrated similar patterns in the use of different types of inference, though generally Group B participants inferred less often than Group A. The use of contextual knowledge-based inference was the predominant type in both groups, followed by the use of experiential knowledge-based inference, and then collocation-based inference. The other two types of inference, including generalized inference and morphological knowledge-based inference, were not commonly used strategies. These results indicate that an interpreter's encyclopedic knowledge derived from experience, their contextual knowledge developed from text-reading, as well as their linguistic knowledge in detecting collocational relations, are particularly helpful in determining the meanings of unfamiliar words during the B-to-A ST. In comparison, the reason for the low frequency of generalized inference might be related to the fact that this strategy comes with the risk of missing important meaning details and therefore is probably an unfavored expedient option. The similarity between the two groups also indicates that the two groups of student interpreters, though at different training stages, relied on similar strategies in inferring the meanings of unfamiliar words during B-to-A ST.

It is also worth noting that the advanced student interpreters in Group B used more collocation-based inference than the first-year student interpreters in Group A (35 vs. 25). This is the only inference strategy that was used more by Group B than Group A. As both groups achieved similar IELTS results in reading (7.0 or above) at the time of the experiment, it is possible that longer training might help Group B participants develop a better sense in detecting lexical and grammatical collocations than the first-year student interpreters, which helped them in making an inference.

4.2.3 The use of multiple types of inference

Participants in both groups were found to have used more than one type of inference simultaneously to deal with the “unknown” and “uncertain” English words in the ST process. Figure 4 shows the percentage of each type of inference that was adopted jointly with other types of inference.

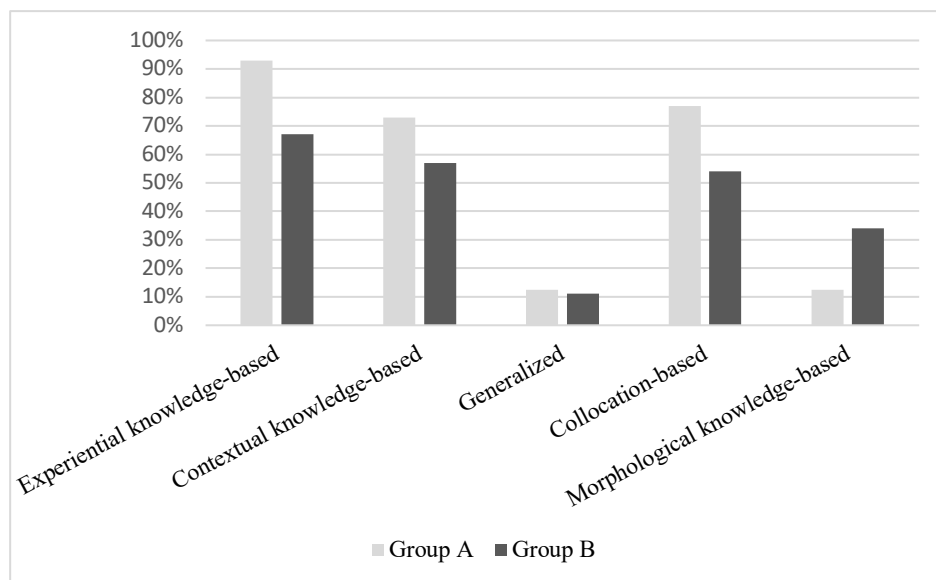


Figure 4. Participants' use of multiple types of inference

As illustrated in Figure 4, again, both groups showed a similar pattern when multiple types of inference were used simultaneously: the use of multiple types of inference often involved experiential knowledge-based inference (93% in Group A; 67% in Group B), and/or contextual knowledge-based inference (73% in Group A; 57% in Group B), and/or collocation-based inference (77% in Group A; 54% in Group B). In other words, these three types of inference were less likely to be adopted alone; rather, participants in both groups showed a similar frequency pattern to use more than one of these types of inference simultaneously.

Moreover, the two most frequent combinations of multiple types of inference are presented in Table 5:

Table 5. Two most frequent combinations of multiple types of inference to cope with unfamiliar English words

The use of multiple types of inference	Group A (total count in all three source texts)	Group B (total count in all three source texts)
Experiential knowledge + contextual knowledge	34	8
Experiential knowledge + contextual knowledge + collocation knowledge	8	10

It can be seen from Table 5 that the interaction between participants' pre-existing knowledge about the subject matter (i.e., their experiential knowledge) and the newly developed contextual knowledge (through reading the source

texts) played an important role in processing the meaning of unfamiliar words in B-to-A ST. In other words, it often required the joint efforts of both to determine the meaning. Additionally, when collocation knowledge was required in processing the meaning of unfamiliar words, it often worked together with the interpreters' experiential and contextual knowledge.

4.3.3 *The use of inference and the accuracy of target language output*

Addressing the third research question, this section discusses the effectiveness of each type of inference in achieving accuracy in the ST output. To assess the accuracy of the translation involving unfamiliar words, all cases where an inference was made in sight translating these words were marked by the two investigators independently. Although the focus was on the handling of “unknown” and “uncertain” words, the accuracy in translating these words was assessed at the sentence level according to their acceptability to the target audience. The translation of each sentence containing an unfamiliar word was marked either as “acceptable” or “problematic”. An “acceptable” translation means that the translation enables the target audience to receive the accurate information that is originally included in the source text. As all three texts are “know-how” texts, an acceptable translation of them means that by hearing the ST, the target audience would know which appropriate steps to take in order to achieve the same intended outcome that the source texts aim to achieve originally. In comparison, a problematic translation means it may cause misunderstanding or may mislead the target audience to taking inadequate steps or not taking the correct steps. An illustrating example of a problematic translation is presented below.

Source text: Then coat the end (of the thermometer) with a little petroleum jelly for easier insertion.

Participant's translation:

之后，还需要用一些，嗯，胶状的物质，来涂在它的一端，温度计的一端，然后，这样做的目的是让，为了更好地能够插入。

Back translation: Then, (you) also need some, um, gel-like substance, to be applied to one end, one end of the thermometer, and then, the purpose of doing this is, is for better insertion.

In the example above, the participant used the generalized inference, “胶状物质 (gel-like substance)”, to refer to “petroleum jelly” in the source text. According to the retrospective interview, the participant explained that she was not sure about the Mandarin equivalent of “petroleum jelly” though she was aware during ST that this was some jelly-like lubricant. Although the translation sounded natural to the target audience, it was treated as a problematic ST in the analysis because “substance” was too general, and the specific details about the type of the “substance” were lost in the translation. This may potentially cause an inappropriate use of any gel-like substance for the purpose of easy insertion, which was not originally meant in the source text.

Table 6 presents the total number of unfamiliar words, including both the “unknown” and “uncertain” English words in the vocabulary check list, identified by each first-year student interpreter in Group A, as well as the accuracy rate of their translations through the use of inference. The accuracy rate was counted based on the percentage of acceptable translations out of the total number of inference cases being assessed.

Table 6. Accuracy rate of Group A

Participant	Number of unfamiliar English words processed	Accuracy rate in English-to-Mandarin ST
1	22	91%
2	22	77%
3	19	53%
4	18	61%
5	17	76%
6	19	74%
7	17	82%
8	20	60%
9	19	53%
10	13	62%
Average	19	69%

Table 7 presents the accuracy rate achieved by each advanced student interpreter in Group B through the use of inference.

Table 7. Accuracy rate of Group B

Participant	Number of unfamiliar English words processed	Accuracy rate in English-to-Mandarin ST
1	18	89%
2	15	100%
3	11	100%
4	13	85%
5	10	100%
6	15	80%
7	20	95%
8	13	69%
9	15	100%
10	17	59%
Average	15	88%

When comparing the results in Tables 6 and 7, one can see that on average the advanced student interpreters in Group B had fewer “unknown” and “uncertain” English words to deal with on average than the first-year student interpreters in Group A (15 vs. 19), though the difference does not appear to be significant.

Moreover, the average accuracy rate of Group B was higher than that of Group A (88% vs. 69%) and the difference is more telling when viewed with the total number of unfamiliar words identified by each group. These results reveal that the advanced student interpreters were more capable of using various types of inference to successfully determine the meaning of unfamiliar words in the English-to-Mandarin ST tasks. In general, both groups achieved good accuracy rates, with the lowest rate at 53% (by Participant 9 in Group A). This finding indicates that, despite the individual differences, all participants’ inference in this study was generally useful, and in many instances inference helped participants work out an acceptable translation of “unknown” and “uncertain” words.

Based on the discussion in 4.2.3, three types of inference were most frequently used by both groups: the experiential knowledge-based inference, the contextual knowledge-based inference, and the collocation-based inference. These three types of inference were either used alone or jointly with one or more other types of inference.

To take a step further in exploring the effectiveness of inference in achieving accuracy, in the following discussion, we focus on the use of the above three major types of inference and examine if different conditions under which they were used (i.e., used alone or simultaneously with other strategies) impacted accuracy in the ST. Figures 5 and 6 present the quantitative results of accuracy rates that participants achieved with the use of the three major types of inference in two different conditions: used as a single strategy or used together with one or more other inference strategies.

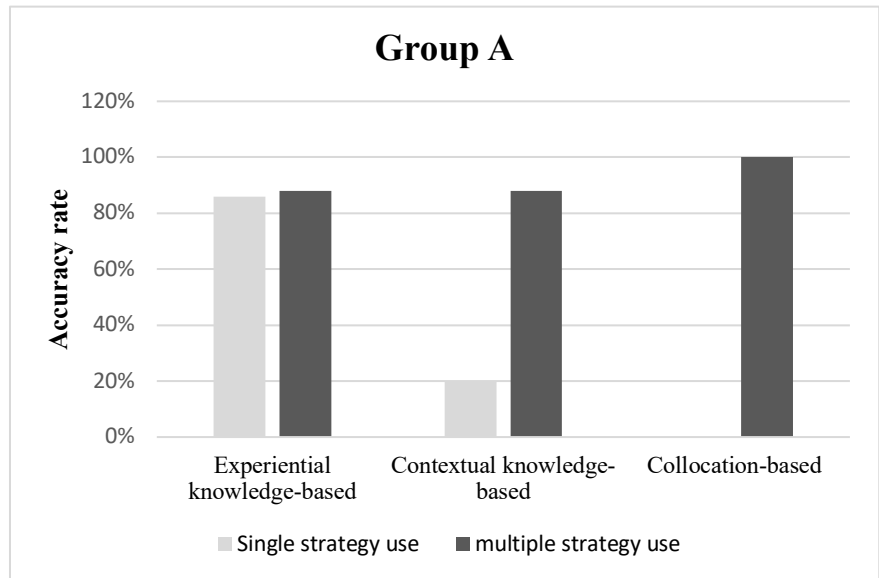


Figure 5. Accuracy and three major types of inference used by Group A

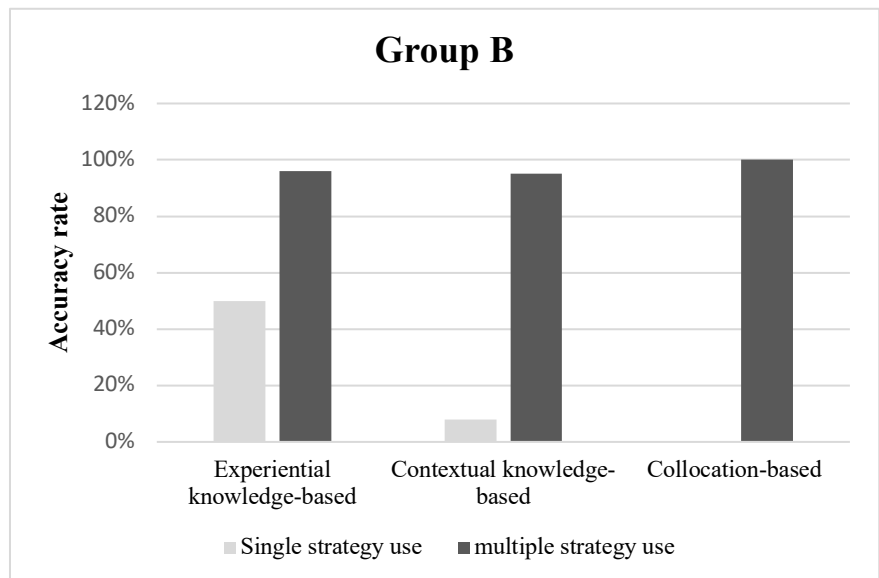


Figure 6. Accuracy and three major types of inference used by Group B

As shown in Figures 5 and 6, when used as a single strategy, only experiential knowledge-based inference was effective to yield an acceptable accuracy rate (at 86% in Group A and 50% in Group B). The other two types achieved a poor accuracy rate when used as a single strategy. Results also

showed that collocation-based inference could not achieve any accuracy when it was used alone. This indicates that, when making a collocation-based inference, interpreters also need to draw on other meaning clues, especially those related to their experiential and contextual knowledge, to help infer the meanings of unfamiliar words. In fact, there was a noticeable difference in accuracy rate between the use of a single strategy and the use of multiple strategies, and this difference was found in both groups. This finding indicates that, when only one type of inference was adopted, the accuracy rate could not be guaranteed. In contrast, when more than one of the three major types of inference were employed simultaneously, the accuracy rate rose considerably. Again, this tendency was found in both groups. This indicates that a successful inference relies largely on more than one type of knowledge clues. Therefore, it is reasonable to argue that the availability of an interpreter's different types of knowledge, including their encyclopedic knowledge, contextual knowledge developed by reading the source text and linguistic knowledge about lexical and grammatical collocations, plays a key role in dealing with the challenges brought by unfamiliar words. To achieve a high level of accuracy in the B-to-A ST of unfamiliar words in one's non-native language, interpreters need to develop both linguistic and extralinguistic knowledge, based on which different types of strategies can be effectively employed.

5. Conclusion

This study has explored Mandarin/English student interpreters' strategies in dealing with "unknown" and "uncertain" English words during English-to-Mandarin (B-to-A) ST tasks. In addressing the research questions, our main findings are summarized below.

Firstly, when encountering unfamiliar words (described as "unknown" and "uncertain" words in the vocabulary test) during B-to-A ST tasks, both the first-year and the advanced student interpreters used omission in some situations to avoid translating the unfamiliar words in the source texts and thus reduce the risk of making mistakes in the target language output. Meanwhile, in other cases, participants also attempted to make an inference of the meaning of an unfamiliar word during the ST tasks. Quantitative results revealed that experiential knowledge-based inference, contextual knowledge-based inference and collocation-based inference were the three predominant types of inference adopted by both groups of student interpreters in this study. Multiple types of inference were often employed simultaneously by the same participant. There was little noticeable difference in the use of inference strategies between the two groups of student interpreters.

Secondly, between the two groups of participants, the first-year student interpreters tended to make more "passive omissions" than the advanced student interpreters, indicating that the first-year student interpreters were more likely to become "blocked" by unfamiliar words during B-to-A ST tasks than the advanced student interpreters.

Thirdly, to achieve accuracy in the B-to-A ST of unfamiliar words, the use of any of the three major types of inference alone was not very effective. Nevertheless, when one of the three major types of inference was used concurrently with any other type of inference, the accuracy rate increased markedly.

The key findings of this research have important pedagogical implications. Firstly, it is important to make student interpreters aware that, rather than

getting stuck on unfamiliar words in the source texts of B-to-A ST tasks, there are active coping strategies that one can employ to work out an effective translation. As shown by the quantitative results of this study (see section 4.3.3), even the first-year student interpreters achieved a high accuracy rate when they made an inference based on multiple knowledge clues. Secondly, as most of the strategies identified in this research are based on interpreters' different types of knowledge (both linguistic and extralinguistic), it is important to raise student interpreters' awareness of the need to develop knowledge in various domains. Interpreting trainers can also explore strategies in training students to become effective readers who are sensitive to contextual information and are able to detect contextual clues during reading. Interpreters' existing experiential knowledge and contextual knowledge stored in the short-term memory, need to interact and complement each other, so as to find a solution for translating unfamiliar words in the source text. In this way, a guessing is not purely intuitive, but strategic.

This study has limitations that need to be acknowledged. For example, it is not clear if the accuracy rate in translating the unfamiliar words was also impacted by the vocabulary test being conducted before the B-to-A ST tasks, as participants taking the vocabulary test were inevitably exposed to particular lexical items included in the source texts, which may have improved their performance in the subsequent ST tasks. In addition, this study was based on the observation of 20 student interpreters only. It would be interesting to examine whether a larger-scale study on ST of both language directions based on data generated by more student interpreters and professional interpreters will yield statistical strengths and generate similar findings. We hope that the current paper will attract more research interest in the area of ST, and serve as an initial step for larger and comprehensive research projects in the near future.

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