# A CORPUS-BASED STUDY OF COLLOCATIONS IN CHINESE-TO-ENGLISH CONSECUTIVE INTERPRETING

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**Thesis submitted for the degree of Doctor of Philosophy**

**in Translating and Interpreting Studies**

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April, 2024

## Abstract

In consecutive interpreting, interpreters, under the constraints of alternate processing of two languages, the mental lexicon of source and target language, and a limited capacity of working memory, are expected to produce speeches that conform to target language conventions. Collocations, habitual co-occurrences of words for more than purely grammatical reasons, are indicators of the naturalness of language use.

Seeking to understand features of collocations in second-language interpreted speeches and possible factors leading to the features, this study investigates the use of collocations by Chinese-speaking trainee interpreters in Chinese-to-English consecutive interpreting. Collocations were extracted and compared across two self-built corpora: a corpus of interpreted speeches by trainee interpreters at mock conferences and a corpus of spontaneous speeches by first-language speakers of English. The frequency, diversity, complexity, and naturalness of ten types of collocations in interpreted speeches were analysed with reference to English conventions. To understand underlying reasons for typical collocation features of interpreted speeches, this study than compared interpreted speeches with source speeches.

Results show that while trainee interpreters used the ten types of collocations in different manners, interpreted speeches are generally less conventional than first-language English speeches, characterised by a less frequent, less diverse, and less complex use of collocations. Trainee interpreters also produced collocations that do not habitually occur in English. Drawing on models of late bilinguals' mental lexicon and language control in interpreting, this study suggests that these deviations from English conventions partially stem from collocations stored in interpreters' mental lexicon and the interference from Chinese expressions. Additionally, interpreters may use collocations in a way that helps them avoid overloading their working memory.

This study underscores the importance of collocations in interpreting research and interpreter training. It contributes to existing theories of consecutive interpreting by emphasising interpreting

as a context in which bilingual processing occurs. Furthermore, the corpus-based method used in this study offers a promising approach to assessing naturalness of interpreted speeches.

## Acknowledgments

"The light is at the end of the tunnel". My supervisor Jade, kept telling me this during my PhD, which supported me during this journey of PhD study. Now, I'm standing at the end of this tunnel and finding myself enjoying the whole journey all the time, even those “bitter” moments. In completing this project, I gradually became an independent researcher and a resilient person.

Admittedly, it is not easy to devote years to a project that may only be cared about by less than 1% of people in the world after its completion. Luckily, I met people who saw the value of this work and were generous in offering help. My deepest thanks go to my main supervisor, Dr. Jade Biyu Du, for her unlimited patience, encouragement, and understanding. As a rigorous scholar and a responsible educator, Jade influenced me greatly with her academic spirit, which I believe will keep inspiring me in my future career. I would also like to thank my secondary supervisor, Dr. Yalta Ya-Yun Chen, for her suggestions on this project and for offering me opportunities to teach at the postgraduate level. With her guidance, I managed the progress of this project efficiently and grew in my role as a translator and interpreter trainer.

Many thanks to Dr. Michael Jin and Dr. Jennifer Arnold for their valuable feedback and advice at the annual progress panels. Sincere gratitudes sent to my viva examiners Dr. Claire Shih and Dr. Damien Hall, for their kindness during the viva and invaluable suggestions to this thesis. Thanks to Professor Jens R. Hentschke, who has always been devoted to building a friendly research culture in the School of Modern Languages, which enabled me to connect with other researchers and become a part of the research community. I am also grateful for my dear friends and PhD colleagues, Dr. Xueman Cao, Mr. Zigeng Chen, Miss Cen Cong, Miss Zijun Feng, Qiaochu Guo, Dr. Wenbo Guo, Miss Sihan Zhong, who have provided me with much support and have encouraged me wholeheartedly the whole time.

Finally, it goes beyond words to express my gratitude to my husband, Mr. Dongyu Meng, my parents, Mrs. Xingyi Wu and Mr. Xinghong Wang, and my parents-in-law, Mrs. Hong Zhang and Mr. Defu Meng, for their unconditional trust and love.

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# Abbreviations

AoA: age of acquisition

ADJ: adjective

ADV: adverb

AT: alternative translation

BNC: British National Corpus

CIS: Corpus of Interpreted Speeches

CNS: Corpus of Non-interpreted Speeches

ESL: English as a second language

EFL: English as a foreign language

L1: first language

L2: second language

GT: gloss translation

MB: morphemic breakdown

MI: mutual information

N: noun

OoA: order of acquisition

PoS: part of speech

PREP: preposition

RHM: Revised Hierarchical Model

RSTTR: random sampled type/token ratio

SLA: second language acquisition

SS: source speech

STTR: standard type/token ratio

TESOL: Teaching English to Speakers of Other Languages

TTR: type/token ratio

IS: interpreted speech

V: verb

VSSP: the visuo-spatial sketchpad

# Chapter One. Introduction

## 1.1 Research rationale

Beyond grammatical rules, the production and comprehension of language are claimed to be largely based on collocations, the habitual co-occurrence of words (Erman & Warren, 2000; Kjellmer, 1994; Schmitt, 2012; Siepmann, 2011; Wray & Perkin, 2000). As parts of the conventions of language, many collocations are stored as fundamental units in language users' mental lexicon, i.e., the cognitive system that constitutes the capacity for storing and retrieving words' meaning, pronunciation, and syntactic characteristics in long-term memory (Bonin, 2004; Elman, 2004).

During language production, language users are believed to retrieve collocations as whole chunks from the mental lexicon (Pawley & Syder, 1983; Uchihara et al., 2022), which is less cognitively demanding than combining words based on grammatical rules (Tavakoli & Uchihara, 2020). Due to this cognitively-saving feature, the use of collocations is believed to assist language users in mitigating cognitive burden and fluently producing language (De Jong, 2016; Uchihara & Saito, 2019; Uchihara et al., 2022; Wood, 2006, 2009). Language users can also save cognitive resources for tasks such as planning and constructing other discourse units (Boers et al., 2006; Pawley & Syder, 1983).

In addition to facilitating fluent language production, collocations in utterances provide listeners with a sense of naturalness, which means how closely the utterances resemble first language (L1) speakers' language in everyday communication (Schmitt, 2012; Wray & Perkin, 2000). Naturalness of language production enhances the effectiveness of verbal communication, as listeners are more likely to understand a message in a form that they are familiar with (Schmitt, 2012; Wray & Perkin, 2000). Combining words that are not commonly used together may make utterances sound unnatural or awkward, leading to misunderstandings.

In interpreting, the naturalness and understandability of language hold significance for the quality of interpreted speeches (Lee, 2008; Liu, 2013; Dawrant & Setton, 2016). In producing interpreted speeches, interpreters are expected to conform to the target language norms (Lee, 2008), which

can be achieved by using contextually and conventionally appropriate expressions, including collocations (Dawrant & Setton, 2016). Unconventional expressions in interpreted speeches may hinder the comprehension of the target audience and lead to miscommunication (Lee, 2008).

While interpreters are expected to use collocations appropriately in interpreting, their use of collocations is restricted by several cognitive factors. During the production of interpreted speeches, interpreters need to draw expressions from their target language's mental lexicon (Elman, 2004; Jackendoff, 2002). Features of collocations stored in interpreters' mental lexicon would influence the collocation features of interpreted speeches. If interpreters do not have certain collocations stored in mental lexicons as L1 users of the target language do, they may not be able to use these collocations appropriately.

In addition, unlike the production of spontaneous speeches, in which language users only process one language, interpreting involves comprehending source speeches in one language (the source language) and producing target speeches in another language (the target language). During this process, the source language system in an interpreter's cognition is ideally suppressed, and the target language system should be activated to ensure target speeches are produced in the target language, as suggested by the language control model of interpreting (Christoffels & De Groot, 2006). However, the source language system may not always be fully suppressed in interpreters' cognition and may interfere with the production of the target language (Christoffels et al., 2007; Hoshino & Kroll, 2008; Lamberger-Felber & Schneider, 2008; Starreveld et al., 2014), leading to the unnatural sounding of target speeches (Lamberger-Felber & Schneider, 2008).

Working memory may also affect the use of collocations in interpreted speeches. It is used for temporarily storing information from source speeches and allocating attention to multiple tasks, such as recalling source information, reading notes, and drawing expressions from the mental lexicon (Baddeley, 1992, 2000, 2017; Gathercole & Baddeley, 2014). However, the working memory by nature is limited in its capacity of attention allocation and information storage. Under such a limit, if interpreters allocate much attention to accurately reproducing source information and fluently delivering interpreted speeches, they may not pay much attention to monitoring the naturalness of the target language and how they use collocations.

Some studies have investigated typical collocation features of interpreted speeches by comparing interpreted speeches with spontaneous speeches in the same language. These studies mainly operationalise the investigation of collocation features by examining the frequency and diversity of strongly associated collocations (components of these collocations are less likely to be found apart in the target language conventions), common collocations (high-frequency collocations in the target language conventions), and the frequency of infrequent/unattested collocations (collocations are not normally used in the target language) (Dayter, 2019; Ferraresi & Miličević, 2017). It has been discovered that interpreting speeches are generally less collocationally conventional than spontaneous speeches (ibid). Since previous studies are largely quantitative, they do not reflect exactly how interpreters use collocations in interpreting, which makes it difficult to explain why interpreters produced collocations in a way that differs from L1 speakers. To understand this, it is worth conducting a qualitative analysis, especially on features of collocations rarely used by L1 speakers but produced by interpreters, namely unnatural collocations in the present study. Features of unnatural collocations have been analysed in second language acquisition (SLA) studies to uncover factors influencing second language (L2) English learners' use of collocations during English production (Nesselhauf, 2005; Siyanova & Schmitt, 2008; Lu, 2016; Men, 2015). In interpreting, analysing these features would deepen the understanding of factors that may shape the naturalness of interpreted speeches.

In addition to analysing features of unnatural collocations, translating target language collocations word-for-word back into the source language, and comparing the translated collocations with source speeches also help explain how the collocations were rendered from the source speech and why interpreters use them in certain ways. As suggested by Dayter (2019), typical collocation features of interpreted speeches may be relevant to the interference from the source speech, particularly its syntactic structure. In SLA studies, it has been revealed that many unnatural collocations produced by L2 English learners can be translated word-for-word into natural expressions in learners' L1, conveying the intended meaning of the learner (Laufer & Waldman, 2011; Men, 2015; Nesselhauf, 2005). This indicates that the learners may have mapped expressions in their L1 mental lexicon into their L2, either when acquiring their L2 or during the production of the L2 (Wolter & Gyllstad, 2011, 2013; Wolter & Yamashita, 2015). In this regard, the back translation and target-source comparison enable one to identify the role of

the source language in interpreters' use of collocations and other possible factors relevant to the collocation features of interpreted speeches.

Based on the above understanding, this study takes collocation as a focal point, investigating typical collocation features of interpreted speeches produced by Chinese-speaking trainee interpreters in Chinese-to-English consecutive interpreting and possible factors leading to these collocation features. In China, translation and interpreting from Chinese to English are often Chinese interpreters who speak English as an L2 (Liu & Afzaal, 2021). In Chinese-to-English interpreting, Chinese trainee interpreters produced more unnatural collocations than in English-to-Chinese interpreting, indicating a possibly higher degree of difficulties in using collocations (Chou et al., 2021). Therefore, focusing on Chinese-to-English consecutive interpreting has practical significance for interpreter training.

The language pair of Chinese-English is selected because previous studies (Dayter, 2019; Ferraresi & Miličević, 2017) have concentrated mainly on Italian–English and Russian–English interpreting, where all languages belong to the Indo-European language family. As Wang and Zou (2018) and Setton (1999) noted, interpreting is highly language-pair specific: different language pairs may pose different challenges to interpreters, influencing the target speech production. Therefore, findings of collocation features of interpreted speeches in previous studies may not apply to Chinese–English interpreting, one of the major language pairs in conference interpreting (Wang & Zou, 2018). Working in Chinese and English, interpreters may demonstrate different features in their use of collocations in interpreted speeches compared with those working in Italian–English and Russian–English. Investigating the use of collocations in Chinese–English interpreting would unveil how the processing of Chinese and English, which differ greatly in their linguistic properties, influences the naturalness of interpreted speeches.

In addition to the language pair, the present study focuses on trainee interpreters, as previous studies mainly probed into the interpreting output of professional interpreters. Interpreters' linguistic competence, including the ability to use target language collocations appropriately, influences the quality of interpreted speeches. Upon admission into translation and interpreting

programmes, trainee interpreters are often perceived to possess a comprehensive proficiency in both their A and B languages (Gile, 1992). However, the language proficiency of trainee interpreters, particularly with respect to their B language, may not be adequately developed to support them in fulfilling the complex demands of interpreting tasks (Herrero, 2015). Given this, it has been posited that courses within interpreter training should be designed to enhance trainee interpreters' A and B language proficiency (Cerezo Herero, 2013, cited in Herrero, 2015). Whilst the importance of language teaching in interpreter training is recognised, the extent of the purported insufficiency of trainee interpreters' linguistic competence remains an area requiring empirical verification. An in-depth exploration of the use of collocations by trainee interpreters, and a comparison of interpreted speeches with the conventions of the target language, could provide empirical evidence as to whether and how the emphasis on language teaching should be adjusted in interpreter training.

As for the mode of interpreting, previous studies (Dayter, 2019; Ferraresi & Miličević, 2017) have primarily focused on simultaneous interpreting, while consecutive interpreting – a mode employed in various settings such as international conferences, court hearings, and business negotiations – remains under-investigated. Though compared with simultaneous interpreting, consecutive interpreting allows a longer time for interpreters to recall the source speech information and formulate the target language, interpreters still need to concurrently process multiple tasks, such as reading notes whilst formulating English expressions and recalling information in the working memory while retrieving expressions from long-term memory (Gile, 2009). This multitasking nature of consecutive interpreting could also impose significant demands on interpreters' working memory, which may influence how they use collocations in interpreted speeches. In addition, due to the time lag between the source and the target speeches, in consecutive interpreting, the information temporarily stored in interpreters' working memory decays over a short time (Cowan, 1999; Portrat et al., 2008; Zhang & Luck, 2009), which means interpreters may continually confront the risk of information loss during the interpreting process. Since the use of collocations could ease the cognitive burden on language users (De Jong, 2016; Uchihara & Saito, 2019; Uchihara et al., 2022; Wood, 2006, 2009), investigating how interpreters make use of collocations in consecutive interpreting would also shed light on how interpreters manage the limited capacity of working memory in consecutive interpreting.

By unveiling the collocation features of interpreted speeches, this study can serve as an important foundation for Chinese-speaking trainee interpreters to understand the differences between interpreted speeches and spontaneous speeches, and hence help them build a more robust English mental lexicon, and enhance the naturalness of interpreted speeches. Since consecutive interpreting is usually the initial mode of interpreting learned by trainees prior to progressing to simultaneous interpreting, investigating the use of collocations by trainee interpreters in consecutive interpreting can provide valuable insights into features of trainee interpreters' output at the early stages of the training process, which has the potential to inform and guide the development of future pedagogical strategies and curriculum design in interpreter training programmes.

### 1.2 Research questions and aims

This research explores how Chinese-speaking trainee interpreters use collocations in Chinese-to-English consecutive interpreting. The overarching aim is to identify typical collocation features of L2 English interpreted speeches, as compared with English conventions, and to uncover factors that may be relevant to these collocation features.

Specifically, three research questions are answered:

RQ 1: Do collocations in interpreted speeches differ from those in L1 English spontaneous speeches with regard to frequency, diversity, and complexity?

RQ 2: What characterises unnatural collocations in interpreted speeches?

RQ 3: What factors may have led to typical collocation features identified in addressing RQ 1 and RQ2?

### 1.3 Methodology

This study adopts the corpus method for evaluating the extent to which the use of collocations in interpreted speeches conforms to the target language conventions. This method enables the researcher to quantitatively extract collocations from large collections of interpreted and non-

interpreted speeches and make comparisons (Shlesinger, 1998), which would otherwise be difficult to be completed by human only.

Specifically, three corpora are used in this study, including a parallel corpus of Chinese source speeches and English interpreted speeches by 79 trainee interpreters, a monolingual corpus of L1 English spontaneous speeches, and a reference corpus sampled to represent the contemporary use of British and American English. Specific information of the three corpora is noted in Chapter Three.

In addressing RQ 1, the researcher compared interpreted speeches in the parallel corpus with the corpus of English spontaneous speeches, revealing if there are statistical differences with regard to the frequency, diversity, and complexity of collocations across the two corpora. The frequency of collocations is the number of collocations in each corpus. Diversity refers to the proportion of different collocations to the total number of collocations and complexity is reflected by the proportion of strongly associated and common collocations to all collocations.

In answering RQ 2, the researcher extracted unnatural collocations from the interpreted speeches using the reference corpus and English dictionaries. To increase the reliability of results, the researcher recruited L1 English speakers to rate the naturalness of collocations in interpreted speeches. Raters also provided appropriate collocations that can better convey the meaning based on the context in which the unnatural collocations occurred. Based on the target speech context, the researcher then searched English dictionaries for conventional expressions that can convey the intended meaning of unnatural collocations. The differences between unnatural collocations and the conventional expressions in dictionaries and raters' suggestions were then analysed thematically. Based on the thematic analysis, this study then generated features of unnatural collocations.

To explore possible reasons behind the collocation features of interpreted speeches observed in answering RQ 1 and RQ 2, the researcher translated all collocations in interpreted speeches word

for word into Chinese, searched for Chinese source speeches of all English collocations in the parallel corpus, and compared the Chinese translations with Chinese source speeches. Collocations that have natural word-for-word Chinese translations conveying the intended meaning of the interpreter are defined as congruent collocations, indicating the possible influence of interpreters' Chinese mental lexicon. This study also defines the similarities and differences between the translated Chinese texts and the source speeches as interpreting shifts, which reflect the possible influence of the source speeches and the influence of the working memory capacity. Interpreting shifts were then categorised thematically based on their syntactic and semantic features.

## 1.4 Thesis structure

This thesis consists of seven chapters. The previous sections of Chapter One have explained the rationale for researching collocations in interpreted speeches, followed by the elucidation of research aims and research questions, and an overview of methodology.

**Chapter Two** is a comprehensive review of relevant literature on collocations in the context of L2 English production, translation, and interpreting. It begins by highlighting the role of collocations in facilitating fluent and natural language production. Following this, the notion of collocation is clarified based on three major approaches adopted in previous studies in defining and classifying collocations. This chapter then reviews empirical studies on typical collocation features of L2 English, translated texts, and interpreted speeches. Studies on factors contributing to these collocation features are also discussed. In constructing a theoretical framework, this chapter then introduces models of late bilinguals' mental lexicon, the language control (suppressing the language not in use and activating the language in use), and the interference of the source language on the target language production in interpreting. In addition to the two models, the theory of working memory and its connection to consecutive interpreting are also addressed in this chapter.

**Chapter Three** presents the methodology of this study. This chapter commences by explaining the rationale behind the compilation of corpora, followed by the procedure of corpora compilation. Then, this chapter presents the data analysis procedure, explaining the types of

collocations under exploration, the parameters selected to indicate the collocation features of interpreted and non-interpreted speeches, and the sources of reference in evaluating the frequency, diversity, complexity of collocations, as well as features of unnatural collocations. Following this, the procedures for identifying possible factors associated interpreters' production of collocations are delineated. Taken together, this chapter provides a detailed account of the methodological considerations and procedural underpinnings that guide the present study.

**Chapter Four** presents findings of collocation features observed in the corpora of interpreted and spontaneous speeches. Based on the comparison of the two corpora, this chapter unveils whether the use of collocations by trainee interpreters in Chinese-to-English consecutive interpreting conforms to English conventions. This chapter first reports results of the comparison of the frequency, diversity, and complexity of collocations in the corpus of interpreted speeches and the corpus of spontaneous speeches. Following this, features of unnatural collocations in the interpreting corpus are analysed.

**Chapter Five** sets the stage for discussing the potential factors leading to typical collocation features of interpreted speeches. This chapter presents the five types of interpreting shifts identified in the interpreting corpus, illustrating how collocations in interpreted speeches were rendered from Chinese source speeches. Following this, the possible relation between interpreting shifts and the frequency, diversity, complexity of collocations, and features of unnatural collocations in interpreted speeches is analysed. This analysis illuminates possible factors leading to the typical collocation features of interpreted speeches.

**Chapter Six** explains this study's findings from a cognitive perspective and places the findings in the context of existing literature. In the first section of this chapter, the focus is accorded to the potential impact of trainee interpreters' Chinese and English mental lexicon on their use of collocations. Then, drawing on the model of language control in interpreting and findings of source language interference on target language production in interpreting, this chapter explains how the parallel activation of Chinese and English language systems may have shaped the collocation feature of interpreted speeches. This chapter then advances to discuss the role of the inherent limitation of working memory capacity, evaluating how this finite cognitive resource, when taxed by the complex demands of Chinese-to-English consecutive interpreting, might affect

the use of collocations in interpreted speeches.

**Chapter Seven** concludes the thesis by summarising the major findings of this study. The contributions and implications are then stated. This chapter also acknowledges the limitations of the investigation and provides directions for future research.

# Chapter Two. Literature Review

Before answering the three research questions of this study, several preliminary questions need to be addressed. These questions include why collocations are important and worth investigating in consecutive interpreting; how collocations can be operationally defined and extracted from texts; and how collocations are investigated in existing SLA, translation, and interpreting studies. Theoretical accounts also need to be made of possible factors influencing the use of collocations in Chinese-to-English consecutive interpreting. These questions are addressed in this chapter.

Collocations, as linguistic items, belong to an umbrella term of formulaic sequences, and in some studies, collocations are not delimited from other types of formulaic sequences. Therefore, Section 2.1 explains the importance of formulaic sequences, including collocations, in language production and comprehension. To operationalise the extraction of collocations from corpora, approaches taken by previous studies to defining and extracting collocations are reviewed in Section 2.2. Since trainee interpreters in this study are L2 English speakers, SLA studies' methodologies and findings of how L2 English speakers process and produce English collocations would shed light on this study. Therefore, section 2.3 reviews methods and major findings of SLA studies on L2 English collocations. Section 2.4 presents methodologies and findings of translation and interpreting studies on collocations, followed by theoretical considerations regarding cognitive processes relevant to the use of collocations in consecutive interpreting in Section 2.5. In Section 2.6, a summary of this chapter is provided.

## 2.1 The importance of collocations in language comprehension and production

The notion of collocation is a subcategory of an umbrella term, formulaic sequences. It has long been recognised that language includes a large proportion of formulaic sequences (Biber et al., 2004; Cowie, 1992; Howarth, 1998; Sinclair, 1991; 2004; Siyanova & Martinez, 2015), which, in Sinclair's (1991, 2004) understanding, refer to frequently recurring lexical combinations. These lexical combinations are parts of the conventionality of a language, encompassing collocations, lexical bundles, fixed expressions, idioms, and other lexical combinations. According to Sinclair (1991, 2004), language derives meaning primarily from formulaicity rather than individual words (Sinclair, 1991, 2004). During language production, speakers "have available to them a large number of semi-preconstructed phrases that constitute single choices" (Sinclair, 1991, p. 110),

which they draw directly from their mental lexicon. Echoing Sinclair, Mel'cuk (1998) contended that "people speak in set phrases, rather than in separate words" (p. 24), emphasising the crucial role of set phrases in language production. The formulaic tendency, or the "idiom principle" of language, as Sinclair (1991, p. 109) termed it, is considered a natural feature of language (e.g. Erman & Warren, 2000; Siepmann, 2011), challenging the traditional notion that languages consist of single words constrained by a system of grammatical rules[1].

A considerable proportion of formulaic sequences have been identified in written and spoken English of various registers, which supports the claim of the idiom principle (e.g. Biber & Barbieri, 2007; Conrad & Biber, 2005; Howarth, 1998; Van Lancker-Sidtis & Rallon, 2004; Wray, 2002; Wray & Perkins, 2000). For instance, Erman and Warren (2000, p. 31) examined the occurrence of formulaic sequences in day-to-day English conversations. The two authors used the term "prefabs" for formulaic sequences, defining them as "combinations of at least two words favoured by native speakers in preference to an alternative combination which could have been equivalent had there been no conventionalisation". At least one component of the prefab cannot be replaced by a synonymous word without changing the meaning or function and/or naturalness of the prefab. Based on human rating, the two authors identified prefabs in seven speeches extracted from the London Lund Corpus of Spoken English and ten written extracts from the Lancaster-Oslo-Bergen corpus, discovering that prefabs account for around 55% of the total number of words of the two corpora. This result indicates that formulaic sequences constitute a significant portion of language. Conrad and Biber (2005) examined another type of formulaic sequences, i.e. three- and four-word lexical bundles in conversations and academic writings produced by L1 English speakers. Lexical bundles are defined as structurally complete and the most frequently recurring lexical combinations in the sampled text in Conrad and Biber's (2005) research. The two authors focus on lexical chunks because they hypothesise that this type of formulaic sequence is used as unanalysed chunks by language users in various registers. It was revealed that lexical bundles account for 20% to 25% of the occurrences of words in conversation and academic writing, being "basic building blocks" for discourse (p. 63). In a follow-up study, Biber and Barbieri (2007) explored the use of four-word lexical bundles in spoken and written university registers, such as classroom teaching and textbooks, revealing that lexical bundles

[1] The tendency of filling single lexical items into sets of grammatical structures in language production was named the open-choice principle of language by Sinclair (1991, p. 110), being contrary to the idiom principle.

occur in all university registers. All these findings underscore that formulaic sequences form an essential part of written and spoken English.

Given their frequent occurrence, it is not surprising that formulaic sequences fulfil a variety of needs in communication, such as conveying routine meanings (e.g. "For here?" as a common query for eating inside a restaurant in North America) and promoting smooth communication (e.g. "You're welcome" as a standard polite response to expressions of gratitude) (Biber, Conrad, & Cortes, 2004; Schmitt & Carter, 2004; Wray & Perkins, 2000). Members of a language community typically have familiarity with formulaic sequences, which makes the use of them useful in providing a shared ground for listeners and speakers and facilitating more effective communication. As Wray and Perkins (2000) and Schmitt (2012) argued, using formulaic sequences is more efficient in communication than using novel expressions, as listeners are more likely to comprehend a message if presented in a conventional form they have previously encountered. For instance, a conventional expression such as "I'm very sorry" is more effective in conveying the intended meaning than a less common phrase such as "I'm feeling apologetic towards you" (Schmitt, 2012, p. 2). This familiarity allows listeners to process the information without analysing the language structure. One area where the effectiveness of formulaic sequences is particularly evident is in military commands, which require quick and uniform responses (Wray & Perkin, 2000). By utilising set phrases familiar to soldiers, such as *at ease* and *about turn*, a commander can elicit rapid and consistent reactions from a large group of soldiers.

In SLA, developing the knowledge of formulaic sequences enables English learners to improve the naturalness of their English production (Ding & Qi, 2005; Meunier, 2012; Wray, 2008). Being proficient in a language means being able to produce grammatically correct utterances and knowing whether the utterances are conventionally used in the language (Biber et al., 2004; Wray, 2002). By learning English formulaic sequences, English learners can expand their knowledge of the habitual co-occurrence of words in English and produce the language more naturally. As argued by Cowie (1992, p. 10), "It is impossible to perform at a level acceptable to native users, in writing or speaking, without controlling an appropriate range of multiword units". A lack of formulaicity may mark English output as being inappropriate and influence its linguistic acceptability (Ackermann & Chen, 2013; Ding & Qi, 2005; Howarth, 1998).

From a psycholinguistic perspective, it has been discovered that formulaic sequences are processed significantly faster than nonformulaic sequences, which are also named "creatively generated language" (Conklin & Schmitt, 2008, p. 72) in both L1 and L2 comprehension and production (Jiang & Nekrasova, 2007; Schmitt & Carter, 2004; Siyanova et al., 2011; Tremblay & Baayen, 2010). Creatively generated language refers to utterances created by combining lexical items based on grammatical rules of language. Based on evidence obtained from experiments, previous studies have proposed that formulaic sequences are processed faster because they are stored and retrieved as whole units from the mental lexicon. When producing and recognising formulaic sequences, the brain does not need to make an extra effort to construct a grammatical structure and to put together lexical items, which requires less working memory capacity and reduces the cognitive load of language users (Caillies & Declerq, 2011; Carrol & Conklin, 2020; Titone & Libben, 2014). This processing advantage has been observed in different types of formulaic sequences, including collocations (Siyanova & Schmitt, 2008; Vilkaitė, 2016; Vilkaitė & Schmitt, 2019), binominals (e.g. Arcara et al., 2012), phrasal verbs (Blais & Gonnerman, 2013; Paulmann et al., 2015), and lexical bundles (Arnon & Snider, 2010; Hernández et al., 2016).

Since formulaic sequences are easier to process than nonformulaic ones, the use of formulaic sequences helps L2 English users ease the cognitive burden and reach native-like fluency in producing English (Wood, 2006, 2009; Wray, 2002). To become proficient and fluent English users, L2 English learners need to acquire a large number of formulaic sequences. The benefit of formulaic sequences to L2 English production is supported by empirical evidence. Wood (2006), for instance, conducted a longitudinal study on how using formulaic sequences helps improve L2 English learners' English spoken fluency in 6 months. It was discovered that as the participants gradually learned to make use of formulaic sequences in spontaneous speeches, they tended to make fewer pauses and keep longer runs of speech between pauses, which suggests fluency growth. Wood (2006) also revealed how the use of formulaic sequences helps L2 English learners reduce disfluencies. Wood showed that L2 English learners tend to strategically use formulaic sequences in speaking English, such as repetitively producing the same formula, using multiple formulas to extend utterances between pauses, using formulas as fillers, and organising the

discourse with formulas. Wood's findings echo Wray's (2002) on the functions of formulaic sequences, indicating that by using formulaic sequences, L2 English learners may control information flow, allow time for mental processing of other aspects of utterances, organise their utterances, and reduce pauses, which all contribute to the fluency development of their spoken English.

The importance of formulaic sequences in L1 and L2 comprehension and production sheds light on translation and interpreting, which involves the processing of two languages. Broadening their knowledge of formulaic sequences enables translators and interpreters to more readily recognise these linguistic structures in source speeches, thereby facilitating comprehension. Similarly, an enriched formulaic sequences stocked in mental lexicon makes it is more likely for translators and interpreters to produce abundant formulaic sequences in interpreted speeches. However, the role of formulaicity in translating and interpreting remains an underexplored topic compared with L2 acquisition studies. Existing studies have mainly focused on the cognitive effect of formulaic sequences in interpreting and translation, revealing that formulaic sequences in source and target speeches ease the cognitive load of interpreters and contribute to the fluency of target speech production (Plevoets & Defrancq, 2018; Van Rietvelde et al., 2010). For instance, Plevoets and Defrancq (2018) reported in a corpus-based study that in simultaneous interpreting, interpreters have less processing difficulty when they encounter formulaic sequences in source speeches and when their production includes more formulaic sequences. Van Rietvelde et al. (2010) conducted an experiment and provided evidence that the presence of formulaic sequences in source speeches for simultaneous interpreting tasks helps trainee interpreters anticipate upcoming information. The authors suggested that it may be because formulaic sequences alleviate the memory load during the interpreting process, thereby freeing up capacity for other cognitive tasks. All these findings highlight the importance of formulaic sequences in reducing the processing demands of language use and facilitating the interpreting process for interpreters.

In sum, formulaic sequences facilitate efficient communication and are important for natural and fluent language production. In interpreting, formulaic sequences reduce the cognitive demand of multitasking and increase the fluency and, potentially, the naturalness of target speech production. Though the term "formulaic sequence" seems useful in revealing the idiom principle of languages

and distinguishing conventional expressions from those constructed by grammatical rules, this notion has been approached differently, with claims made on different types of formulaic sequences. As noted by Wray (2002, p. 9), a formulaic sequence is a concept that has been described using over 50 different terms. Among those terms, some focus on the multiword and frequently occurring feature of formulaic sequences, as in *lexical bundles* (Biber et al., 2004; Chen & P. Baker, 2010), *multiword units* (Greaves & Warren, 2010; Stubbs, 2007), and *bigrams* (Bestgen & Granger, 2014); some focused on the semantic fixedness feature, such as *fixed expressions* (Alexander, 1984) and *phraseology* (Granger & Meunier, 2008); others highlight the psycholinguistic characteristic of formulaic sequences, such as *prefabricated chunks* (Song, 2020) and *prefabs* (Granger, 1998a). Compared with other types of formulaic sequences, collocation is the most frequently defined type in previous studies, based on criteria of frequencies, degrees of semantic and grammatical fixedness, lengths, and cognitive functions (Siyanova et al., 2011; Vilkaitė, 2016). In SLA studies, collocations are discovered to impose more difficulties to English learners, even advanced learners, in English production, leading to deviations from L1 English conventions (Lu, 2016; Men, 2015). Deviations means structural and semantic differences between unnatural collocations L2 learners produce and the conventional English collocations in L1 English. For the present study, an investigation of collocations will shed light on how L2 English interpreted speeches deviate from the L1 English conventions. Therefore, this study focuses on collocations, the notion of which will be further elaborated in the following section.

## 2.2 The notion of collocations

The notion of collocations[2] finds its origin in the 18th century. When discussing the compilation of an alphabetical index for *the Bible*, Cruden (1850) suggested that some lexical items in the *Bible* tend to co-occur frequently when texts are split and made into an alphabetical index (Barlow, 2004, p. 207). Thereafter, the co-occurrence of lexical items was noticed by scholars and noted in dictionary compilation (Ayscough, 1790) and language teaching studies (Palmer, 1933). In 1957, the notion of collocation was raised and explained by Firth (1957) from a purely linguistic perspective. According to Firth (1968), lexical items in languages are not isolated but

[2] Kennedy (1988, pp. 14, 108) traced the basic idea of collocation back to 1737 via Cruden's study on the concordance of lexical items in the *Bible*. Cruden's index for the *Bible* became a major data source for the compilation of the first edition of the *Oxford English Dictionary*.

tend to co-occur with and predict each other. Moreover, the meaning of a word is relevant to the lexical items that habitually co-occur with it, in what Firth (1968) noted is "a mutual expectancy of words" (p. 196). Firth (1957) also classified collocations into "usual collocations" and "more restricted technical/personal collocations" (p. 195), though he did not further elaborate on the boundary between the two types of collocations. Firth is one of the few early scholars who called attention to the phenomenon of collocations in language, which laid a foundation for collocation studies in linguistics. However, the concept of collocations raised by Firth is general and requires further operational clarification. As suggested by Esser (2000), Firth only gave cliché examples such as *You silly ass* or *He is an ass* as collocations of *ass*" (p. 155) but did not specify what kind of lexical combinations can be regarded as collocations and how to retrieve collocations from texts. In addition, the definition of collocations provided by Firth concerns the formal co-occurrence of lexical items only, excluding the occurrences of lexical combinations motivated by "social and cultural reality" (Herbst, 1996, p. 384) and "semantic compatibility" (Palmer, 1968, p. 6), which may be equally important in the identification of collocations.

Despite the limitations, Firth's (1957) suggestion, "you shall know a word by the company it keeps" (p. 179), inspired various definitions of collocations, among which at least three approaches can be identified. All these approaches aim to set up criteria for defining collocations, which facilitates the extraction of collocations from authentic language data. The first approach focuses on the semantic aspect of collocations, regarding collocations as lexical combinations with a degree of semantic fixedness (Aisenstadt, 1979; Cowie, 1998; Howarth, 1998). This approach mainly concentrates on differentiating collocations from other lexical combinations, such as free combinations and idioms, and was named a *phraseological approach* by Nesselhauf (2005). The second approach views collocations as the co-occurrence of lexical items within a certain distance in texts (Firth, 1957, 1968; Halliday, 1961; Sinclair, 1991). Lexical combinations that occur more frequently than others in a language are considered collocations. Since this approach emphasises the frequency of collocations, it was termed a *frequency-based approach* (Hoey, 2012; Nesselhauf, 2005; Sinclair, 1991, 2004). Scholars of the third approach, i.e. the structural approach (Benson et al., 2010; Nattinger & DeCarrico, 1992), see collocations as integrations of grammatical and lexical relations among lexical items, believing that, as a central factor, grammar cannot be separated from lexis when determining whether a lexical combination is a collocation. The three approaches define collocations based on different criteria: frequency,

semantics, and grammatical structures. Among the three approaches, the phraseological approach is mainly adopted in observing problematic lexical combinations for L2 English users, and the frequency-based approach has set the trend for corpus-based lexical studies. The structural approach is believed to be useful for pedagogically oriented collocational studies in L2 acquisition studies (Woolard, 2000). The following subsections review the three major approaches, laying a foundation for developing an operationalised definition of collocations for this study.

### 2.2.1 The phraseological approach

Scholars adopting the phraseological approach define collocations mainly by their semantic fixedness. Based on the degree of semantic fixedness, phraseologists categorise lexical combinations into three types: free combinations, collocations, and idioms (Howarth, 1998; Nattinger & DeCarrico, 1992). **Idioms** represent the highest degree of semantic fixedness of lexical combinations (Cowie, 1998; Howarth, 1998; Nesselhauf, 2005). They have a figurative meaning unrelated to the literal meaning of their components. Therefore, the meaning of idioms is not transparent, and if one component of an idiom is substituted by a synonymous word, the meaning of the idiom and other components will be altered. For instance, *spill the beans* (Cowie, 1998, p. 214) means revealing secret information unintentionally. The meaning of the idiom completely absorbs the meaning of the components *spill* and *beans* and is not transparent. Substituting either *spill* or *beans* leads to an alteration of the idiom's meaning. **Free combinations** are of the lowest degree of fixedness. They are lexical combinations where the meaning can be deduced from the meaning of the components. Every component of free combinations is used in its literal sense and can be substituted by many synonymous words without altering the meaning of other components (e.g. *read a book, play games, good day*). **Collocations** are in a “fuzzy zone” (Men, 2015, p. 21) between free combinations and idioms in the phraseology approach. At least one component of a restricted collocation is used in its literal sense, and at least one component is used figuratively (Cowie, 1998; Men, 2015). The meaning of collocations can be deduced from the literal meaning of its components. One can substitute the components of restricted collocations with only a small group of synonymous words without changing the meaning of the other components. For instance, *pay one’s respects* is considered a collocation (Cowie, 1998, p. 216). The literal meaning of *pay* is giving money to someone as a form of compensation for their work, products, or services. However, in the collocation *pay one’s*

*respect*, *pay* is used figuratively, meaning giving, and *respects* is used in its literal meaning. The figurative meaning of *pay* is determined by the meaning of *respects* because *respects* can only be replaced by a limited number of nouns, such as a *compliment* and *court*. Otherwise, the figurative meaning of *pay* will be changed (e.g. *pay the bill*, *pay a wage*).

From the above classifications, one may find it evident that phraseologists evaluate the semantic fixedness of lexical combinations based on three criteria: semantic transparency of the entire combination (Cowie, 1992, 1998; Howarth, 1998), figurative usage of components (Cowie, 1992, 1998; Howarth, 1998), and substitutability of components (Howarth, 1998; Nesselhauf, 2005). Semantic transparency relates to whether a lexical combination has a figurative meaning that is not readily deducible from the literal meaning of its components. This criterion is useful in distinguishing idioms from non-idioms, as the meanings of idioms are not merely the sum of their components. For instance, the idiom *curry favour* means acting in a way that is overly nice or helpful to someone to gain their approval. *Favour* refers to approval or support for someone or something, and *curry* used to carry the meaning such as “put in order”, “arrange” and “apparel”. However, the old meanings of *curry* have been obsoleted in contemporary English and now *curry* means Indian-style dishes (Oxford English Dictionary, 2023). In this regard, when *curry* and *favour* are combined, the literal meanings of the words *curry* and *favour* do not lend themselves to an intuitive understanding of the idiom *curry favour*. In comparison, the meanings of collocations and free idioms, such as the collocation *commit a crime* and the free combination *control the crime* (Men, 2015, p. 21), can be deduced from their components.

When it comes to collocations and free combinations, the meaning of components and substitutability are central criteria in differentiating these two types. According to phraseologists such as Howarth (1998) and Nesselhauf (2005), a lexical combination must have at least one component with a figurative meaning (e.g. *pay* in *pay attention to*, *adopt* in *adopt a method*) to qualify as a collocation. Furthermore, components of a collocation should be substitutable with a limited number of synonyms without altering the meaning of other components in the combination. These two criteria help differentiate collocations from free combinations. All components of the latter have literal meanings and can be replaced by a larger range of words without affecting the meaning of the other components (e.g. *blue sky*; *big tree*). For instance, in

the free combination *blue sky*, both *blue* and *sky* are used in their literal sense. When *blue* is replaced by other words, such as *grey*, *black*, or *pink*, the meaning of *sky* in the combination remains unchanged. Similarly, *sky* can be replaced by words that *blue* can modify, such as *ocean*, *jacket*, and *eyes*, without changing the meaning of *blue* in the combination. Therefore, *blue sky* is a free combination.

This phraseological classification of lexical combinations shows that idioms, collocations, and free combinations form a continuum from fixed to loose regarding the semantic associations among the components. The three criteria also offer operational guidance in identifying collocations with phraseological value from texts. However, practically distinguishing collocations from free combinations based on the two criteria of substitutability and component meaning is challenging. As noted by Hudson (1998) and Nesselhauf (2005), these criteria often contradict each other in categorising lexical combinations. For instance, in the lexical combination *face a financial crisis*, *face* is used figuratively, meaning “having to deal with a particular situation” (Nesselhauf, 2005, p. 26). Based on the criterion that in a collocation, at least one component is used in its non-literal sense, *face a financial crisis* should be considered a collocation. However, *face* can collocate with any objects referring to difficult or unpleasant situations, such as *face a daunting task, face a period of unemployment, face her anger* (Nesselhauf, 2005, p. 26). From this perspective, *face a financial crisis* seems to fall into the category of free combination.

An additional limitation of the phraseological approach lies in the subjective determination of the degree of substitutability and the meaning of components in lexical combinations. When assessing the substitutability of components, the concept of "a small number of synonymous nouns/verbs" (Howarth, 1998, p. 169) is not easily quantifiable. Consequently, researchers may arrive at different conclusions when categorising the same groups of lexical combinations. For instance, in *commit a crime*, both *commit* and *crime* are used with their literal meanings. Based on the criterion that both components are used in literal meaning in free combinations, *committing a crime* should be considered a free combination. However, Nesselhauf (2005) noted that synonyms cannot substitute *commit* without changing the meaning of *commit a crime*. Therefore, *commit a crime* is considered a collocation by Nesselhauf, and it seems that in some

collocations, every component is used with its literal meaning but is restricted in its substitutability.

Furthermore, the phraseological approach demands substantial human ratings, which may prove impractical when processing large volumes of language data. The subjective nature of this approach and the potential for discrepancies in categorisation among researchers highlight the need for more objective and quantifiable methods to improve the accuracy and efficiency of identifying collocations. In the next subsection, a more objective approach to collocations, the frequency-based approach, is introduced.

### 2.2.2 The frequency-based approach

Scholars adopting the frequency-based approach restrict the notion of collocation to statistically significant co-occurring words. For instance, Greenbaum (1974) defined collocations as the "frequent co-occurrence of two lexical items in the language" (p. 82). Hoey (1991) suggested that only if a lexical item appears with other items "with greater than random probability in its (textual) context" (pp. 6–7) are they considered collocations. A higher probability suggests an increased likelihood that a particular lexical combination is a collocation. However, both Greenbaum and Hoey did not specify the threshold of the frequency of co-occurrence, with the notion of collocations remaining vague. To retrieve collocations from language data, one needs a more operational definition.

Sinclair (1991, 2004) further clarified the notion of collocations by seeing them as a co-occurrence of two or more than two lexical items that are not necessarily adjacent to each other or in fixed order. Moreover, Sinclair combined previous frequency-based definitions with corpus linguistics methodology, suggesting the retrieval of collocations with a concordance tool[3] (Sinclair, 2004). To illustrate how collocations are retrieved, Sinclair put forward three key concepts: **node**, **collocate,** and **span**. A **node** refers to the central word or keyword whose collocations are under investigation. A **span** is "the number of lexical items on each side of a node" (Sinclair, 2004, p. 10). The lexical items co-occur with the nodes within a certain span and

[3] A concordance tool is a corpus searching tool that allows us to retrieve a specific sequence of lexical items of any length from a corpus. It displays concordance lines with context before and after the sequence of lexical items in the form of one example per line.

are named **collocates**. For instance, if A is the node and B occurs next to A, B is "a collocate at span position +1". If there is a word between A and B, B is "a collocate at span position of +2" (Sinclair, 2004, p. 34). Researchers may track the collocates of a node within a certain span if they set all the parameters in advance with a corpus concordance tool. The definition of collocations provided by Sinclair marks a good start for studies on collocations. Key concepts raised by Sinclair, such as node, span, and collocate, have been adopted by other researchers to calculate the frequency of collocations in texts with the assistance of computer tools (Feng, 2014; Grant, 2005: Grant & Bauer, 2004).

Based on the three concepts, i.e. node, collocate, and span, Sinclair (1991) further proposed four parameters that determine whether a lexical combination can be regarded as a collocation: "the length of the text in which the node and collocates co-occur, the frequency a node occurs in the corpus, the frequency the collocates occur in the corpus and the frequency a node and the collocates co-occur in the corpus" (p. 115). To extract collocations, one has to compare the frequency of a potential collocate within a certain span around the node with the collocate frequency in the rest of the corpus. If the difference is significant, the collocate and the node under testing form a significant collocation.

However, absolute frequency is not the best indicator for the statistical significance of a collocation because some lexical combinations only occur frequently in certain contexts or are produced by certain speakers (Gablasova et al., 2017). In an example provided by Gablasova et al. (2017, p. 160), *risk issues* and *moral issues* occur 54 and 51 times, respectively, in the British National Corpus (BNC), which is highly similar. However, the 54 instances of *risk issues* occur in one text only. In comparison, *moral issues* are distributed evenly in over 41 texts, which means *risk issues* may not be a collocation that L1 English speakers would produce. Therefore, the distribution of the lexical combinations should be considered when testing lexical items' collocability, which can be carried out by "association measures" (Gablasova et al. 2017, p. 159).

There are over 50 types of association measures (Evert, 2008), among which the t-score and mutual information score (MI score) are the most widely used in corpus-based studies on

collocations (e.g. Bestgen & Granger, 2014; Durrant & Schmitt, 2009; Nguyen & Webb, 2017; Siyanova, 2015). Nevertheless, the selection of association measures seems arbitrary, and it is unclear which measure is the most suitable for collocation studies (González et al., 2015). For instance, Xiao and McEnery (2006) selected the MI score as the association measure when comparing the collocational behaviour of Chinese and English only because "it is built into the corpus tools" (p. 105) they used. Gablasova, Brezina, and McEnery (2017) compared three association measures (t-score, MI score, and Log Dice) from the perspective of the mathematical reasoning behind the measures, the influence of corpus size on the testing results, and the practical effects of the measures. It was discovered that the accuracy of the t-score was strongly dependent on corpus size. The larger the corpus, the more accurate the t-score test was. Compared with the t-score, the variation in MI scores and Log Dice values was smaller when the corpus size changed. This subsection (2.2.1) makes no further elaboration on the comparison among different association measures; the methodological consideration of the association measures adopted is discussed in Subsection 3.3.3.

The frequency-based approach has been found to be useful in investigating large-scale language data because adopting this approach, researchers can quantitatively identify collocations with the assistance of corpus query tools. This approach has adopted this approach in investigating collocations in L2 English corpora. For instance, using the corpus query tool AntConc (Anthony, 2006), Groom (2009) identified collocates of ten prepositions that occurred most frequently in two corpora of English academic writing by Swedish students whose second language is English. The corpora under investigation had 1,221,265 words, which was "amenable to statistical analysis", as Groom (2009, p. 27) noted. The researcher measured the MI score and t-score of lexical combinations including ten prepositions: *of, in, for*, *as, with, on*, *from, at, by,* and *about* and ranked collocates of those prepositions by their statistical association with the prepositions. Similarly, Durrant and Schmitt (2009) extracted adjacent adjective-noun combinations with t-score and MI-score measures from two learner corpora with a total number of 117, 878 words. In the two studies, calculating the MI score and t-score of lexical combinations in the two large-scale corpora would be impossible without the assistance of corpus query tools.

However, a purely frequency-based approach has several drawbacks. First, it ignores the context of words and lacks accuracy when retrieving collocations. Some word combinations, such as "however in the" (Kjellmer, 1994, p. xiv), may recur in texts by coincidence but do not form a significant collocation. Second, the span from which collocates are extracted influences the significance test result. There is no agreement on the most significant span in corpus linguistics (Stubbs, 2001). A corpus-based study by Jones and Sinclair (2012) suggested that a significant collocation window is four lexical items to the left of the node and four lexical items to the right of the node (±4). However, Seretan and Wehrli (2009) argued that the most common span in corpus linguistics is ±5. When retrieving the collocates of *cheese* in BNC using the log-likelihood measure, McEnery and Hardie (2011, p. 128) changed the span from ±3 to ±5 and discovered that only two of the top ten collocates were shared.

To compensate for the limitation of the frequency-based approach, some researchers suggested sorting out collocations manually with the help of concordance tools. Researchers using this concordance-based method scan the concordance lines by eyes and decide whether a lexical combination is a collocation. Compared with the traditional frequency-based approach, the concordance-based method has several advantages. First, as has been suggested by Stubbs (1995), counting, and listing lexical items manually is sufficient for studies based on small corpora. Using a concordance tool, Stubbs (1995, pp. 27–28) discovered that in a corpus of 1.5 million words, there were only ten collocates of *cause*, including *accident*, *alarm*, *concern*, *confusion*, *damage*, *death*, *delay*, *fire*, *harm*, and *trouble*. The semantic relations between these words were "obvious to the researchers", and thus were not required to be tested by association measures based on the frequency of two words co-occurring (Stubbs, 1995). In addition, the concordance-based method makes up for deficiencies of the significance-based approach in that it helps researchers identify collocations that are missed by association measures due to infrequent occurrences (Stubbs, 2001). Moreover, the concordance-based approach provides a context in which lexical items co-occur, which enables researchers to observe the semantic constraints on a word's selection of its co-occurring words. As suggested by Stubbs (2002), "there are always semantic relations between node and collocates, and among collocates themselves" (p. 225).

Though the concordance method improves the accuracy of collocation identification, the frequency-based approach in identifying collocations ignores the fact that collocations are not only "lexically determined" but also "grammatically restricted" (Kjellmer, 1987, p. 163). Components in collocations have syntactic relationships. Benson et al. (2010) argued that, to use a language, one must be able to combine words with other words to form phrases according to certain grammatical rules. Identifying collocations by grammatical structures would be useful in investigating whether language users are familiar with the pre-defined grammatical relations among the components of a collocation (Hunston & Francis, 2000). Considering the pedagogical value of grammatical rules in L2 English teaching and learning, some researchers (Benson et al., 2010) added grammatical structure as another criterion to define collocations, which is referred to as a structural approach in the present study. In the next subsection, the structural approach is introduced.

### 2.2.3 The structural approach

Scholars of the structural approach (Benson et al., 2010; Nattinger & DeCarrico, 1992; Wray, 2002) see collocations as integrations of grammatical and lexical relations among lexical items (Nelson, 2000). Studies in this approach consider grammar as a factor that cannot be separated from lexis when determining whether a lexical combination is a collocation. Only lexical items that appear in certain grammatical relations are regarded as forming a collocation (Hausmann, 1989).

Studies in the structural approach focus on how grammar and lexis interrelate through collocations. Sinclair, although he did not consider grammar when discussing collocations in his earlier work, integrated grammar and lexis in his later works and suggested that "many uses of words and phrases show a tendency to co-occur with certain grammatical choices" (Sinclair, 1991, p. 112). Working with a one-million-word corpus of spoken British English and a ten-million-word corpus of written English, Renouf and Sinclair (1991, p. 128) investigated grammatical structures that consist of a sequence of two words with an empty slot between them, such as *a + ? + of*, *be + ? + of*, and *an + ? + of*. The two scholars named these grammatical structures "collocational frameworks" (Renouf & Sinclair, 1991, p. 128) and discovered that lexical items do not randomly occur in a collocational framework. Some lexical items occur more frequently in

certain collocational frameworks than other words. For instance, the words that fill the slot of *a + ? + of* structure are often nouns, indicating the grammatical restriction on collocations.

The structural approach classifies collocations by grammatical structures. There is a general agreement in the literature that there are two types of collocations: lexical and grammatical (e.g. Bahns, 1993; Benson et al., 2010; Nelson, 2000). A grammatical collocation consists of "a dominant word" and "a particle" (Benson et al., 2010, p. xiii). The dominant words include nouns, adjectives/participles, and verbs; the particle refers to a preposition, an adverb, or a grammatical structure such as an infinitive or a clause. For example, *by accident, to adhere to, eager for, eager to (do something),* and *to become (someone or something)* are all grammatical collocations. Lexical collocations consist of content words only, such as verbs, nouns, adjectives and adverbs (Benson et al., 2010, p. xiv). They do not include grammatical words, such as prepositions and infinitives, and have structures such as verb + noun, adjective + noun, noun + verb, noun + noun, adverb + adjective, adverb + verb. Examples of lexical collocations are *to put up resistance, a formidable challenge, a herd of cattle,* and *deeply absorbed* .

With the development of corpus query tools, quantitatively extracting collocations by grammatical structures has become possible. Many corpus-based studies have adopted the structural approach to compare typical collocational features of L1 and L2 English utterances, shedding light on L2 English teaching and learning. It has been discovered that the grammatical structure of collocations plays a role in the acquisition and production of collocations by L2 English learners. For instance, verb + noun and verb + preposition collocations are more error-prone and may take longer to be acquired by L2 English learners than noun + noun and adjective + noun collocations (Nesselhauf, 2005; Men, 2015). Moreover, the use of collocations with different grammatical structures reflects the proficiency level of English learners (Granger & Bestgen, 2014; Paquot, 2019). For instance, Paquot (2019) revealed that L2 English learners with a higher proficiency level perform better in producing adverb + adjective, adverb + verb, adverb + adverb, and verb + direct object collocations. Empirical findings concerning the influence of the grammatical structure of collocations are further elaborated in Subsection 2.3. In sum, all these studies show that the grammatical structure of collocations influences the "gradual acquisition of the syntagmatic axis" of English (Granger & Bestgen, 2014, p. 240) and may

restrict how language users make use of collocations. Therefore, the structural aspect is worth consideration when defining and extracting collocations.

The preceding discussion on the three approaches to collocations offers a comprehensive understanding on the concept of collocations from statistical, semantic, and grammatical aspects, thereby establishing a foundation for the present study. In developing a working definition and classification of collocations for Chapter Three, the advantages and limitations of these approaches have been taken into consideration, as will be further explained in Subsection 3.3.1.

Expanding to a broader research context, existing studies have employed the three approaches to identify distinctive collocation features in L2 English and to explain these observations using L2 lexical acquisition theories. Furthermore, apart from the cognitive-oriented studies reviewed in Subsection 2.1.1, only a handful of translation and interpreting studies have explored the use of collocations, primarily focusing on the features of collocations in translated texts and interpreted speeches and the influence of source texts or speeches on these collocation features. The following sections review previous findings and explanations regarding collocations produced in L2 English, translation, and interpreting.

## 2.3 Collocations in SLA studies

In the present study, many trainee interpreters have English as the second language (ESL) and used to be English as a foreign language (EFL) learners in China. Therefore, findings and discussions on how ESL and EFL learners use English collocations can provide insights into the present study. EFL learners are those who learn English in non-English speaking countries, whereas ESL learners acquire English in countries where English is used officially as a tool for communication (Gass & Selinker, 1992; Gilquin & Granger, 2015). In this study, ESL and EFL learners are collectively named English learners, and the English they produce is named L2 English. The extent to which English learners use collocations has been a recurrent focus in SLA studies, and existing research shows that collocations can pose challenges for English learners, potentially leading to their language sounding non-L1-like (e.g. Barfield & Gyllstad, 2009; Howarth, 2013). This section reviews major findings regarding typical collocation features of L2

English and factors influencing the use of collocations by English learners.

### 2.3.1 Typical collocation features of L2 English

***Methodologies adopted by SLA studies***

Before reviewing the key findings of SLA studies, it is necessary to discuss their research methods for investigating collocations in L2 English. The most frequently used method for investigating L2 collocation features is comparing collocations extracted from an English learner corpus with those from an L1 reference corpus. Employing this method, many studies have focused on the collocation features of L2 written English (e.g. Alejo-González, 2010; Chen & P. Baker, 2010; Durrant & Schmitt, 2009; Howarth, 2013; Nesselhauf, 2005). For instance, Durrant and Schmitt (2009) compared collocations in two corpora: a corpus of L2 English argumentative writing produced by ESL learners from a British university and an English-medium university in Turkey, and a corpus of L1 English argumentative essays produced by British undergraduates and opinion articles from two UK newspapers. In addition to L2 written production, collocations in L2 spoken English has also been of interest to researchers, though the number of relevant studies is relatively smaller (Crossley & Salsbury, 2011; De Cock, 2004). For instance, De Cock (2004) compared the use of word sequences in L1 English utterances and utterances of EFL speakers.

To extract collocations from corpora, a large number of studies have adopted the frequency-based approach, identifying and categorising collocations using raw frequency, t-scores, and MI scores (e.g. Durrant & Schmitt, 2009; Gablasova et al., 2017; Granger & Bestgen, 2014). Using t-score and MI-score measures, these studies have attempted to uncover how English learners make use of common English collocations and strongly associated collocations, which indicates the complexity of collocation usage. Others have employed the phraseological approach, manually extracting collocations based on their semantic fixedness (e.g. Men, 2015; Nesselhauf, 2005). Studies adopting a phraseological approach mainly aim to explore if collocations, which usually include at least one semantically opaque lexical item according to phraseologists' definition, impose difficulties on English learners. Some studies adopted a structural approach to defining collocations, aiming to understand if English learners struggle to produce collocations with a certain grammatical structure (e.g. Laufer & Waldman, 2011; Nesselhauf, 2005). Various types

of collocations have been investigated, with a primary focus on premodifier + noun collocations (e.g. Durrant & Schmitt, 2009; Siyanova & Schmitt, 2008), verb + noun collocations (e.g. Howarth, 2013; Laufer & Waldman, 2011; Nesselhauf, 2005) and intensifier + adjective collocations (Granger, 1998a; Paquot, 2019).

The variance in methodology, such as different types of corpora used, and various approaches to defining, extracting, and evaluating collocations, means that it is not simple to compare results obtained in existing studies directly. Nevertheless, a number of common findings of typical collocation features of L2 English have been reported, which mainly concern the frequency, complexity, and diversity of L2 English collocations, and features of unnatural collocations.

***The frequency of collocations in L2 English***

Studies comparing the frequency of collocations in L1 and L2 English reveal that though English learners make use of English collocations, they generally produce fewer collocations than L1 English users (Granger, 1998b; Howarth, 1998, 2013; Laufer & Waldman, 2011; Nesselhauf, 2005). This means unlike L1 English users, who often have natural collocations ready when constructing utterances, English learners tend to combine individual words at the time of L2 production, rather than directly using collocations. As noted by Kjellmer (2014), the "building materials (of L2 production) are individual bricks rather than prefabricated sections" (p. 124). Kjellmer's claim regarding L2 production was supported by Laufer and Waldman (2011). Adopting a frequency-based approach to collocations, Laufer and Waldman (2011) investigated verb + noun collocations in argumentative and descriptive, nontechnical essays of EFL learners in Israeli high schools, English teacher-training programs in colleges and English departments at a university. Comparing the L2 English essays with essays written by British A-level and university students and American freshman university students, the two authors discover that L2 English learners, with Hebrew as the L1, produced collocations in their essays at a frequency half of that exhibited by L1 English users. A similar tendency for the underproduction of collocations in L2 English was observed by Howarth (1998, 2013), who also focused on verb + noun collocations. Employing a phraseological approach to identifying collocations, Howarth (1998, 2013) compared the proportion of verb + noun collocations in a corpus of English essays produced by ESL learners in the master's program of applied linguistics with those in L1 English

essays. ESL learners in Howarth's (1998, 2013) study had diverse L1 backgrounds, including German, Greek, Japanese, Mandarin, More, Thai, and Tswana. The results showed that ESL learners produced fewer verb + noun collocations than L1 users in English academic writing, indicating that ESL learners may have fewer collocations stored in their mental lexicon.

### *The diversity of collocations in L2 English*

In addition to the less abundant use of collocations, English learners are discovered to be more restricted in the range of English collocations/lexical bundles they use, and they tend to repeatedly produce certain collocations (Ädel & Erman, 2012; Chen & P. Baker, 2010). Consequently, L2 English features a higher degree of repetitiveness than L1 English in collocations. Some studies focused on the diversity of lexical bundles in L2 English (e.g. Ädel & Erman, 2012; Chen & P. Baker, 2010). For instance, Ädel and Erman (2012) compared four-word lexical bundles in a corpus of Swedish EFL learners' academic writing and those in a corpus of L1 English academic writing. EFL learners in Ädel and Erman's (2012) study were all undergraduate students in linguistics with a relatively high proficiency level in English. The two authors adopted a frequency-based approach, retrieving lexical bundles occurring for more than or equal to 25 times per million words in the corpus of L2 English. It was revealed that though those EFL learners had a high level of English proficiency, they still used a significantly narrower range of lexical bundles than L1 English speakers. Ädel and Erman then explained that this tendency of being conservative in using collocation may be due to learners' preference to use those that they are more familiar with and such familiarity enables them to avoid making errors in their L2 production (Granger, 1998b; Hasselgren, 1994).

Tsai (2015) used type/token ratio[4] to measure the diversity of verb + noun collocations, comparing a corpus of English writing produced by Mandarin-speaking undergraduate EFL learners and a corpus of L1 written English. The English proficiency of these EFL learners ranged from CEF A2 level (waystage) to CEF C1 level (effective operational). It was discovered that learners' writing showed more limited collocational diversity than L1 English writing,

[4] In corpus linguistics, type means the total number of distinct words, as opposed to the aggregate quantity of all words in a corpus. Tokens refer to the total sum of words in a corpus. The type/token ratio TTR) is calculated by dividing the number of types by the number of tokens. This ratio signifies the lexical diversity of a corpus. The nearer the TTR is to 100, the more extensive the lexical variation becomes.

manifested by a considerable difference in the type/token ratio of collocations between the two groups (L1: 56.23%; L2: 13.63%). Lu (2016) further expanded the research scope by investigating the type/token ratio of fifteen types of collocations (e.g. verb + noun, noun + noun, adjective + noun, adverb + adjective) in English writings of Mandarin-speaking EFL learners and British and American undergraduate students. The results showed that compared with L1 English users, EFL learners used all fifteen types of collocations less diversely in writing. Chinese English learners repeatedly use certain collocations rather than diversifying their collocation usage. For instance, they produce *a lot of* more than 14 times as many times as its alternative *a great deal of* and nearly seven times as often as *plenty of* in writing. Both Tsai (2015) and Lu (2016) agreed that the less diverse use of collocations indicates that EFL learners tend to use a small range of collocations to "play safe" in producing English. As Tsai (2015) noted, restricted by their limited L2 collocation knowledge, English learners tend to "cling to a limited range of low-stakes collocations which they are more confident in using" (p. 735). Lu (2016) also suggested that Chinese English learners tend to repeat collocations that they know or feel more confident with to overcome a lack of L2 knowledge.

***The complexity of L2 English collocations***

The tendency for "playing safe" in the use of collocations is also reflected in the complexity of collocations in L2 English, which were evaluated by MI scores and t-scores in SLA studies. MI scores capture the amount of information shared by components in collocations (Evert, 2008; Gablasova et al., 2017) and usually highlight extremely infrequent collocations in a corpus (Evert, 2008). Collocations with high MI scores, namely strongly associated collocations in some studies (Durrant & Schmitt, 2009; Lorenz, 1999), include components that expect the occurrence of each other and are less likely to be found apart in a corpus. In comparison, t-scores measure whether a collocation is significantly more frequent than its expected frequency. Collocations with high t-scores occur frequently in a corpus and are named common collocations (Durrant & Schmitt, 2009). Nowadays, corpus analysis tools provide easy access to these two statistics. How MI scores and t scores are calculated will be further explained in Subsection 3.3.3.

The two association measures have been applied to investigate collocation features of L2 English. For instance, Lorenz (1999) examined whether strongly associated collocations in L1 English

were overproduced or underproduced by EFL learners. By analysing the use of adjective + intensifier collocations in English argumentative writings by intermediate and advanced English learners with German as L1, Lorenz (1999) revealed that collocations with low MI scores occur more frequently in L2 production; by contrast, collocations with higher MI scores such as *immensely troubled*, *boringly stiff* and *darkly tanned* (Lorenz, 1999, p. 126) are barely used by L2 speakers. Lorenz's (1999) findings indicate lower collocation complexity in L2 English writing. Collocations that are common and are more likely to recur in L1 English are overproduced by L2 English users. In comparison, collocations that are highly restricted in terms of the substitutability of their components and occur less frequently in L1 English are produced less frequently by L2 English users.

Following Lorenz (1999), Durrant and Schmitt (2009) compared English essays written by ESL and EFL learners with those of L1 English users. The two authors took individual variations into account by calculating and comparing collocations used by each English learner and L1 English user. It was reasoned that by doing so, the two authors would know whether the overall tendency observed in the corpus holds for individual L2 and L1 users. Three main findings emerged. First, collocations with high MI scores occur significantly less frequently in L2 writing. Second, both L1 and L2 writers tend to use certain common collocations in their language production repeatedly, but L2 English writers repeat common collocations to a larger extent than L1 English writers. Third, the overall tendencies also hold for individual English learners. The findings of Durrant and Schmitt's (2009) study reflect the tendency of "conservatism" in L2 collocation usage (p. 174). English learners tend to underuse strongly associated collocations but extensively and repeatedly produce common collocations.

English learners' frequent use of common collocations and less abundant use of strongly associated collocations indicate that they may have acquired many common collocations but lack knowledge of strongly associated ones (Durrant & Schmitt, 2009). Such imbalanced collocation knowledge could be relevant to the frequency they encountered these collocations in learning English. Compared with strongly associated collocations, which are less frequent and often rare (e.g. *curry favour*), common collocations (*very good*, *a lot of*) are more likely to be encountered by L2 English learners. Since more frequent encounters lead to greater entrenchment of lexical

chunks, including collocations, in one's memory (Bybee, 2007; Bybee & Hopper, 2001; Langacker, 1987), the frequent encounters with common collocations make it more likely that learners will memorise them. In comparison, strongly associated collocations require considerable language learning experience. Consequently, when producing English output, learners find common collocations more salient in their memory and are more likely to produce them. Ellis et al. (2008) provided psycholinguistic evidence for the processing advantage of common collocations over strongly associated ones. Results of their study showed that L1 English speakers spend less time recognising high-MI-score collocations, whereas L2 English learners are faster in recognising high-t-score collocations (Ellis et al., 2008). This indicates that common collocations are more easily drawn from English learners' mental lexicons than strongly associated ones.

***Unnatural collocations in L2 English***

In addition to frequency, diversity, and complexity of collocations, some studies (Nesselhauf, 2005; Siyanova & Schmitt, 2008; Lu, 2016; Men, 2015) have explored unnatural collocations in L2 English and identified salient features of these unnatural collocations. Unnatural collocations are lexical combinations not conventionally used by L1 English users and are hard for L1 English users to understand (Chang, 2018; Nesselhauf, 2005; Lu, 2016). Adopting a phraseological approach, Nesselhauf (2005) investigated features of 2000 unnatural verb + noun collocations in a corpus of 318 essays written by 207 German-speaking EFL learners. These learners are in their 3rd or 4th year of undergraduate study, aiming to achieve an advanced level of English proficiency. Nesselhauf (2005) first used an L1 English corpus and English dictionaries to identify potentially unnatural collocations from an L2 English corpus and then recruited L1 English raters to assess the naturalness of potentially unnatural collocations based on a five-point rating scale. The author discovered that approximately one-third of the collocations in the L2 English corpus were unacceptable or questionable. The most common feature of unnatural verb + noun collocations is wrong choices of verbs (e.g. *carry out races*). Deviations also occur in other elements of collocations, such as prepositions (e.g. *lose control over*), determiners (e.g. *get the permission*), and in the use of collocations as a whole (e.g. *hold children within bounds*) (Nesselhauf, 2005, p. 237).

Taking a slightly different perspective, some scholars have focused on adjective + noun collocations produced by L2 speakers of English. Adopting a frequency-based approach, Siyanova and Schmitt (2008) explored adjective + noun collocations produced by EFL learners with Russian as their L1. These EFL learners have been learning English for six to 12 years and have reached an advanced level. The results showed that around 55% of the collocations were not attested in the British National Corpus and may include unnatural collocations. Comparing the proportion of unnatural collocations in Siyanova and Schmitt's (2008) study with that in Nesselhauf's (2005) study, it seems that adjective + noun collocations are easier for English learners to produce in a natural way than verb + noun collocations. However, Siyanova and Schmitt's findings may be biased because the naturalness of collocations is evaluated based on BNC only. Collocations occurring more than once are all considered natural collocations. However, the existence of a collocation in a reference corpus does not mean that this collocation is typical in English. As Lu (2016) argued, "the relationship between frequency and acceptability is not an all-or-nothing fact, but a matter of attitudes" (p. 145).

Considering that the use of L2 English collocations can be relevant to the L1 background of language users, some studies have concentrated on how the L1 of English learners may have influenced their L2 collocations. Based on a corpus of argumentative essays written by EFL learners with Mandarin Chinese as L1, a corpus of British and American university students' writing and a reference corpus of standard English, Lu (2016) examined nine patterns of lexical collocations and ten patterns of grammatical collocations produced in L2 English writing. EFL learners in Lu's study are university students in their second to fourth year of undergraduate study. One major finding of Lu's study was that EFL learners tend to produce unnatural collocations that may be formulated based on Mandarin grammar, indicating the potential influence of learners' L1 on their use of English collocations (Lu, 2016). For instance, collocations such as *living level*, *know the society*, *touch the society*, and *good achievements* can be rendered word for word back into natural Chinese expressions but are not conventionally used in English. Another finding of Lu's study was that lexical items with similar meaning, pronunciation, and forms in English are likely to generate confusion about their collocates. For instance, some L2 speakers cannot tell the difference between *resource* and *source* and produce collocations such as *water source*(s) (Lu, 2016, p. 125). Lu also revealed that some L2 collocations produced by Mandarin speakers have strong cultural and social connotations. Expressions such as *English corner* and

*two-day weekends* reflect distinct Chinese cultural features and social realities. Without cultural knowledge, some L1 speakers are likely to misunderstand those collocations. In contrast to earlier scholars, Lu offered a comprehensive analysis of the types and features of unnatural collocations produced by Chinese English learners, though the evaluation of naturalness was conducted by one researcher, potentially introducing subjectivity to the results.

To sum up, studies on the use of collocations in L2 English have yielded fruitful results. A relatively coherent picture from previous research is that EFL and ESL learners, even advanced ones seem to underperform L1 English users in frequency, diversity, and complexity of collocations. These learners also produced unnatural collocations that do not normally occur in L1 English. In the present study, many Chinese trainee interpreters used to be EFL learners in China and are advanced ESL users who have stayed in the UK for at least one year at the time of data collection (Subsection 3.2.1). In this regard, investigating the frequency, diversity, complexity, and features of unnatural collocations in L2 English interpreted speeches, the present study is likely to uncover the difference between interpreted speeches and L1 English and probe into underlying factors influencing interpreters' use of collocations. In SLA studies, the possible factors influencing the use of L2 English collocations have been uncovered, as will be reviewed in the next subsection,

### 2.3.2 Congruent collocations and the influence of L1

The use of L2 English collocations is influenced by various factors, such as language learning experiences of English learners (e.g. Siyanova & Schmitt, 2008), the English proficiency of learners (e.g. Laufer & Waldman, 2011), the influence of learners' L1 (e.g. Altenberg & Granger, 2001; Henderson & Barr, 2010), and the communication strategy adopted by learners (Siyanova & Schmitt, 2007). Among all factors, many are speculations, while the impact of English learners' L1 is theoretically accounted for and empirically tested (Jiang, 2022; Men, 2015; Nesselhauf, 2005; Paquot & Granger, 2012; Wolter & Gyllstad, 2011; Wolter & Yamashita, 2015, 2018; Yamashita & Jiang, 2010).

In L2 English production, the influence of learners' L1 is reflected by congruent collocations among the unnatural collocations. Congruent collocations are L2 collocations that, when translated word for word into learners' L1, retain their grammatical and semantic appropriateness and convey the meaning the English learner intended to convey. In contrast, incongruent collocations are L2 collocations without word-for-word translations in learners' L1 (Men, 2015; Nesselhauf, 2003; Wolter & Yamashita, 2018). Previous studies show that some unnatural collocations in L2 production exhibit grammatical and semantic features of collocations in learners' L1, indicating the interference of learners' L1 with their L2 collocation production (Alejo-González, 2010; Laufer & Waldman, 2011; Lorenz, 1999; Men, 2015; Nesselhauf, 2005).

Nesselhauf (2005) was among the early researchers investigating possible causes of unnatural verb + object + noun collocations in L2 English. The author focused on English writing produced by German-speaking learners. The influence of German on English collocation production was assessed by evaluating whether the German word-for-word translation of an English collocation produced by learners is a natural German expression with the meaning the learner intended to convey (Nesselhauf, 2005). If so, the production of English collocations was assessed as being influenced by German. For instance, *make homework* is misused for *do homework* by learners, and the German word-for-word translation of *make homework* is a natural expression that denotes the meaning of the English collocation *do homework*; in this case, *make homework* is a congruent collocation and is assumed to be an L1-induced unnatural collocation. The author called for a cautious interpretation of results obtained through this approach, suggesting that since there is no way of ascertaining whether L1 influence occurred by examining L2 English products, 200 the similarity between L2 English collocations and German equivalents was considered an indication that influence was likely. Nesselhauf (2005) discovered that 45% of unnatural verb + noun collocations in L2 English writing were German-induced. Under the influence of their L1, German-speaking English learners confused semantically related words and prepositions and misused delexical verbs and articles in verb + object + noun collocations.

Adopting a similar method to Nesselhalf's research (2003) to explore the L1 influence on L2 English learners' use of collocations, Laufer and Waldman (2011) discovered that over 60% of unnatural verb + noun collocations produced by advanced Hebrew-speaking learners were

English-Hebrew congruent collocations, indicating the influence from Hebrew. Laufer and Waldman (2011) suggested that L2 English learners produce unnatural collocations partly because they tend to translate seemingly equivalent collocations in their L1 word-for-word into English but are unaware of whether the words they combine collocate. For example, learners in their study misused *pass the law* for *break the law*, because the word-for-word translation of *pass the law* in Hebrew conveys the meaning of *break the law*. By translating the Hebrew collocation *l'aavor al ha-chok* directly into *pass the law*, the English learners produced an unnatural collocation (Laufer & Waldman, 2011, p. 665).

A similar tendency for L1 influence on L2 collocation usages was observed by Men (2015) in L2 English writing by Chinese-speaking learners. Focusing on verb + noun, noun + noun, and adjective + noun collocations, Men (2015) used the same method as Nesselhauf (2003), discovering that compared with incongruent English collocations, those having structural and semantic equivalents in Chinese were more error-prone for Chinese English learners, indicating the interference from learners' L1. Furthermore, Men (2015) revealed that many unnatural collocations occur because the correct form of those collocations has more than one translation in Chinese. For instance, the meaning of *acquire knowledge* in English has at least three different expressions with an identical grammatical structure in Chinese, for example, *获得知识* (acquire knowledge), *学习知识* (learn knowledge), and *掌握知识* (grasp knowledge). In this case, the English learners seem to have mapped what they know in Chinese onto their English production. Men's findings shed light on why L2 English learners confuse semantically related words in collocations.

The studies mentioned above reveal that English learners' L1 may interfere with their L2 English collocation production, potentially leading to unnaturalness in collocation usage. Learners' L1 leads to the production of unnatural collocations and shapes the collocation patterns in L2 products. For instance, Gilquin (2007) compared *make* + object + noun collocations in the sub-corpus of the International Corpus of Learner English (Granger et al., 2002) and the American sub-corpus of the Louvain Corpus of Native English Essays. It was observed that L2 English speakers with French as their L1 tend to underuse collocations consisting of the verb *make* and

limit themselves to those with formal and semantic equivalents in French (e.g. make progress, equivalent to *faire des progrès* in French). The author reasoned that in French, words do not co-occur with *faire* (= *make* in English) as frequently as words co-occur with *make* in English. As a result, English collocations consisting of *make* are underused, and English equivalents of the limited number of collocations consisting of *faire* become more salient for French-speaking English learners and are produced recurrently. The L1 influence on learners' collocation usage becomes more salient when the collocation usage by learners with different L1 backgrounds is compared. Waibel (2007) conducted a corpus-based study on phrasal verbs (PVs) used by advanced German and Italian English learners in their English writing and compared them with L1 English writing. The findings revealed that German learners used more phrasal verbs than L1 English writers, while Italian learners produced significantly fewer phrasal verbs than L1 English writers. According to Waibel (2007), a possible reason for this outcome is the absence of an equivalent structure for phrasal verbs in Italian, as opposed to German, which led to the underuse of phrasal verbs by Italian English learners.

In addition to investigating the influence of one's L1 on L2 English collocation usage, some studies have conducted experiments to examine whether learners' L1 influences the processing of L2 English collocations. For instance, Yamashita and Jiang (2010) invited Japanese English learners to rate the acceptability of English congruent and incongruent collocations. Participants were required to read a collocation presented on a computer screen and judge its acceptability by pressing a Yes or No button on a keyboard in the shortest time. The results showed that Japanese English learners reacted faster to congruent collocations than incongruent ones in rating the acceptability of English collocations (Yamashita & Jiang, 2010), indicating a processing advantage of congruent collocations over incongruent collocations.

The processing advantage of congruent collocations is explained in two theoretical approaches. One suggests that the congruent collocations are processed faster because L2 English users have both their L1 and L2 activated when processing L2 English collocations (Carrol & Conklin, 2014, 2017; Carrol et al., 2016; Wolter & Gyllstad, 2011, 2013). When presented with an L2 collocation, English learners' L1 collocation knowledge is automatically activated in their mental lexicon, assisting in the recognition of L2 collocations. Therefore, when encountering congruent

collocations, Chinese-speaking English learners will have their Chinese equivalent activated in their mental lexicon, which enables them to process congruent collocations faster than incongruent collocations. The co-activation of language users' L1 and L2 is supported by empirical evidence (Carrol & Conklin, 2014, 2017; Carrol et al., 2016). For instance, Carrol et al. (2016) used eye-tracking devices to examine how highly proficient Swedish-speaking English learners utilised L1 knowledge in processing incongruent English collocations, congruent English idioms, and word-for-word English translations of Swedish idioms. English translations of Swedish idioms were generated, so participants were not familiar with those translated Swedish idioms. The results showed that the Swedish English learners had no difficulties understanding translated Swedish idioms. They also read congruent English idioms and translated Swedish ones significantly faster than reading incongruent English ones. Moreover, no significant difference was observed regarding the processing speed and eye movement of participants in processing congruent English idioms and translated Swedish idioms, indicating that the two types of idioms are processed similarly. Carrol et al. (2016) suggested that the processing advantage of translated Swedish idioms and congruent English idioms over incongruent ones could be explained by the automatic activation of learners' L1 knowledge. Since learners' L1 is activated when they process English collocations, they can associate translated Swedish idioms, which they are likely to have never encountered previously, with their L1 and have no difficulties understanding them. The similar processing advantage of congruent English idioms further suggests that the co-activation of learners' L1 and L2 may have facilitated learners in processing congruent collocations.

Despite this empirical support, the co-activation theory has been challenged by some scholars (Wolter & Yamashita, 2015, Wolter & Yamashita, 2018). Wolter and Yamashita (2018) tested this theory by presenting Japanese-speaking English learners with English word combinations translated word for word from Japanese collocations that have no English equivalents (e.g. *for eye*, *buy anger*), incongruent English collocations and congruent English collocations. Participants were required to rate the acceptability of collocations presented on computer screens by pressing keys, with their response time being recorded. The results showed that though congruent collocations were processed significantly faster than incongruent collocations by learners, translated collocations were not processed significantly faster than incongruent collocations. Wolter and Yamashita (2018) then suggested that the co-activation of L1 and L2

collocation knowledge in learners' mental lexicon may not explain the processing advantage of congruent collocations (similar findings were also obtained in Wolter and Yamashita, 2015).

Based on their findings, Wolter and Yamashita (2015, 2018) proposed another theoretical explanation, namely the order of acquisition (OoA) and age of acquisition (AoA) effects, which is grounded in mapping theory (Ellis & Lambon Ralph, 2000; Izura et al., 2011; Lambon Ralph & Ehsan, 2006; Monaghan & Ellis, 2002). Mapping theory is a learning theory supported by simulation experiments using artificial neural networks (Ellis & Lambon Ralph, 2000). According to this theory, the order in which knowledge is acquired significantly influences how salient it is in one's memory (Ellis & Lambon Ralph, 2000; Lambon Ralph & Ehsan, 2006; Monaghan & Ellis, 2002). Ellis and Lambon Ralph's (2000) experiment revealed that items learned earlier maintain their dominance in the memory even though new sets of items are introduced later. Such dominance will be reinforced if the learner keeps receiving training that is relevant to the early acquired knowledge. When the training for early-learned knowledge stops and learners are continuously introduced to new knowledge, early-learned knowledge will be subsequently replaced by newly introduced knowledge.

Wolter and Yamashita (2015, 2018) applied mapping theory to explain the processing advantage of congruent L2 collocations. This explanation is proposed as an alternative to the co-activation theory but has not been tested by empirical studies. According to Wolter and Yamashita (2015, 2018), at the early stage of L2 English acquisition, L1 collocation structures stored in learners' mental lexicon provide them with ready-made assumptions about the structure of L2 collocations. These assumptions will be confirmed when encountering congruent L2 collocations, with congruent L2 collocations being associated with correspondent L1 structures and stored in the mental lexicon. In comparison, the acquisition of incongruent collocations is not facilitated by L1 collocation structures stored in learners' mental lexicons. Hence, in contrast to congruent collocations, which are apt to be learned earlier, incongruent ones require more time for learners to acquire. As items learned earlier are likely to be more prominent in learners' mental lexicon, the disparity in the acquisition sequence of incongruent and congruent collocations leads to a faster activation of congruent collocations over incongruent ones in the long run. Nonetheless, as pointed out by Wolter and Yamashita (2018), there is still a possibility that certain frequently

encountered incongruent collocations are learned early and become noticeable in learners' memory.

Though the co-activation theory and the AoA and OoA effects have not been empirically tested, they still shed light on how English learners' L1 may influence their collocation processing and can explain traces of learners' L1 identified in L2 English collocations. Since the present study focuses on the use of collocations by interpreters working from L1 into L2, examining the extent to which collocations produced by trainee interpreters include congruent collocations enables the present study to understand if the use of collocations is relevant to the AoA and OoA effects.

In general, collocations are recognised as essential in facilitating natural L2 English production and processing. The above-mentioned studies used corpus-based methods to define and retrieve collocations through the three approaches reviewed in Subsection 2.1.2 and compared learner corpora with L1 English corpora. Their comparative analyses reveal distinctive collocation features in L2 English. Compared with L1 English users, L2 learners employ fewer collocations in their English products. They also demonstrate a conservative tendency by repeatedly producing a limited range of collocations. In addition, this conservatism is evident in their less frequent use of strongly associated collocations and more frequent use of common collocations. L2 English learners are found to produce unnatural collocations deviating from English conventions, which may be under the influence of their L1. The importance of collocations in facilitating the comprehension of source speeches and the production of interpreted speeches has also been acknowledged in translation and interpreting studies. Nevertheless, collocations remain an under-investigated area in translation and interpreting research compared with collocations in L2 acquisition studies. The next section reviews how collocations are explored in translation and interpreting studies and explains the point of departure of the current study.

## 2.4 Collocations in translation and interpreting studies

Most translation and interpreting studies on collocations compare collocation features of corpora of translated/interpreted texts/speeches with corpora of non-translated/interpreted texts/speeches of the same language. Those target-text-oriented studies aim to identify typical collocational

features that distinguish translated/interpreted texts/speeches from non-translated/interpreted texts/speeches. To further investigate factors influencing the use of collocations in translated/interpreted texts/speeches, a few studies have compared collocations in interpreted speeches with their source speeches. This section reviews methodologies and major findings of these studies.

### 2.4.1 Collocation features of translated texts

Using corpus methods, a number of translation studies have identified typical collocation features of translated texts. Interestingly, these studies discovered that translated texts include more collocations than non-translated texts in the same language (M. Baker, 2004; Bernardini, 2007), which contradicts with findings of SLA studies. Such a contradiction might be because these translation studies have mainly examined translation from L2 to L1, where many translators are also professional translators who may have a relatively large number of target language collocations stored in their mental lexicon. Therefore, they are able to make use of these collocations proficiently in producing translated texts. For instance, M. Baker (2004, p. 175) compared a corpus of English fiction and biographies translated from different languages by professional translators who have English as the L1 (6,613,456 tokens) and those in the fiction subset of British National Corpus (BNC) (6,423,325 words). M. Baker mainly examined the frequency of three-word, four-word, and five-word lexical bundles (e.g. *in the middle of, for the first time*), which are frequently recurring lexical combinations in a corpus, being similar to collocations in the frequency-based approach's definition. M. Baker (2004, p. 185) used a corpus query tool named Chains to automatically identify lexical bundles from the two corpora and then manually sorted out recurring lexical bundles. Results showed that lexical bundles occur more frequently in translated texts than in the BNC, indicating that translators are "in a higher reliance" on recurring lexical bundles (M. Baker, 2004, p. 175). The author then suggested that by using many lexical bundles that they are familiar with, translators may avoid mistakes and causing disfluencies in target texts. However, Baker's (2004) study did not examine the statistical significance of the results, making it unclear whether the difference between the two corpora is significant. As M. Baker (2004) noted, "What we need is a piece of software that can run through both lists and automatically identify significant differences in frequencies of phrases occurring in both corpora" (p. 176). In addition, the extraction of lexical bundles was based on the judgment

of one researcher, with the cut-off point of frequently recurring lexical bundles being randomly selected.

A similar tendency to use collocations more in translated texts than in non-translated ones was observed by Bernardini (2007), who constructed a corpus of Italian novels and short stories translated from English by L1 Italian translators (110,01 words) and a corpus of Italian novels and short stories (size: 127,240). Different from Baker's (2004) study, Bernardini (2007) restricted the research scope to collocations, defining and extracting collocations following the frequency-based and structural tradition in linguistic studies (as reviewed in Subsections 2.2.1 and 2.2.3). In addition, Bernardini (2007) suggested that since the two self-built corpora are small, extracting collocations only by their frequency in the two corpora runs the risk of ignoring well-established and frequent English collocations. To address this potential problem, Bernardini used a large-scale reference corpus, The Repubblica Corpus for Italian (340,000,000 words), to identify collocations from the two self-built corpora. In Bernardini's (2007) study, noun + prep/conj + noun combinations were first extracted from the two self-built corpora. Then, all combinations were searched in the reference corpus. Those occurring more than once and with an MI score greater than two in the reference corpus were selected as collocations. In comparing the frequency of collocations in the two self-built translated and non-translated corpora, the author used the Mann–Whitney significance test to examine the statistical significance of the difference. The results showed that the translators produced more noun + prep/conj + noun collocations in translated Italian novels than Italian authors do in Italian novels, indicating that translated Italian is more collocationally conventional than non-translated Italian. Bernardini (2007) outlined a corpus-based method for identifying collocations in translated texts. Association measures and reference corpus reduces the subjectivity of manual identification of collocations, and this time-saving method can be used to retrieve collocations from corpora quantitatively. However, the selection of the cut-off points of frequency and MI score in identifying collocations, as the author noted, is arbitrary and requires further empirical examinations.

Apart from the overall frequency of collocations in translated texts, some studies have revealed that translators tend to repeatedly use certain collocations, making translated texts less collocationally diverse than non-translated texts. These studies mainly focused on L2-to-L1

translation, where translators may have a relatively large number of, and more diverse collocations stored in the mental lexicon. For instance, Dayrell (2007, 2008) compared collocations in a corpus of Brazilian Portuguese fiction translated from English by L1 Brazilian Portuguese speakers (545,395 words) and those in a corpus of non-translated Brazilian Portuguese fiction (565,920 words). Dayrell extracted collocations by selecting ten words occurring frequently and with similar frequency in both corpora and identifying the highest frequency collocates of those nodes. It was discovered that the proportion of recurring collocations to all collocations in translated texts was 25% higher than in non-translated texts. This means the translators tended to use the same collocations repeatedly. Dayrell suggests that this finding may have reflected the tendency of translators to conform to the typical and standard form of the target language. Dayrell's (2008) study called attention to the diversity of collocations in translated texts. However, the analysis was based on 14 collocations extracted from the two corpora, which restricts the representativeness of findings. Moreover, though Dayrell highlighted the possible influence of source texts and language differences on translators' use of collocations, such influence was not investigated with sufficient evidence in the study.

In addition to the diversity of collocation use in translated texts, the complexity of collocations has also been investigated in corpus-based translation studies (Feng, 2020; Feng et al., 2018). It was discovered that the use of collocations in translated texts is more repetitive, simpler in form, and more explicit in meaning than those in non-translated texts. For instance, in constructing a corpus of English commercial texts (5,238,867 words) and a corpus of English-translated commercial texts (5,166,749 words), Feng et al. (2018) extracted collocations from the two corpora by raw frequency, log-likelihood scores, and MI scores (see also Feng, 2020). In Feng et al.'s (2018) study, collocations are lexical combinations recurring at least five times, showing statistical significance in log-likelihood tests, and having an MI score equal to or larger than three. Log-likelihood scores measure the probability two words co-occur in a corpus and highlight collocations with low frequency (Feng, 2014). In addition, the authors manually categorised collocations into free combinations, bound collocations, and idioms by semantic transparency and substitutability (as reviewed in 2.2.1), following a phraseological approach to collocations. Comparing the frequency of the three types of collocations in the two corpora, Feng et al. (2018) showed that translated texts include more free combinations and collocations with a literal sense but fewer semantically open collocations and idioms than non-translated texts. The authors

believe those collocation features in translated texts reflect tendencies of simplification and explicitation in the translated texts, which are two forms of translation universals[5]. Simplification, as a hypothesised universal feature of all translated texts, refers to the tendency of translators to simplify their language use or message, or both in translated texts (M. Baker, 2019, p. 176). In Feng et al.'s (2018) study, simplification was reflected by the more frequent use of free combinations in translated texts than in non-translated texts. In addition, explicitation means translated texts tend to be more explicit in meaning than source texts and non-translated texts in the same language (e.g. Olohan & Baker, 2000). In Feng et al.'s (2018) study, the more frequent use of collocations with literal senses and the underproduction of semantically opaque collocations in translated texts reflects the tendency towards explicitation in the translated language.

Feng et al.'s (2018) study highlighted the importance of collocations in Chinese (L1) to English (L2) translation. It attempted to provide a theoretical account of typical collocation features observed in translated texts. However, the translation universals hypothesis merely describes possible unique features of the translated text. The reason why these unique features occur and to what extent they can be considered translation universals remain under-investigated. As M. Baker (2004) and Bernardini (2007) noted, findings of the comparison of translated and non-translated texts are difficult to explain. Attributing typical collocation features to translation universals masks potential factors influencing translators' use of collocations, such as the cognition of translators, the source texts, and translation strategies. Some studies have proposed potential factors influencing the use of collocations by translators. For instance, Kenny (1998, 2014) hypothesised that the use of collocations in translated texts may be restricted by social-cultural or even economic constraints. To make translated texts more acceptable and to guarantee the fluency of translated texts, translators are more conservative in their use of collocations and may consciously or unconsciously conform to the norms of the target language. Otherwise, target readers might ignore or criticise their works (M. Baker, 2004; Kenny, 2014). Tirkkonen-Condit (2004) argued that some collocations are produced less frequently in translated texts because

[5] The *Translation Universals* hypothesis, proposed by M. Baker (1995, p. 235), refers to linguistic features occurring "with a significantly higher or lower frequency in translated texts than they do in non-translated texts". Translation universals are hypothesised to be common to all types of translated texts and independent of the influence of specific language pairs involved in the process of translation (M. Baker, 2018; Laviosa, 2013).

these collocations do not exist in translators' mental lexicon. However, these hypotheses have not been empirically tested yet.

Some scholars (Bernardini, 2007; Marco, 2009) have approached factors influencing the use of collocations in translation from a linguistic perspective. During the translating process, translators need to convert from the source language into the target language and reproduce the meaning of source texts. It has been suggested that comparing target texts with source texts helps uncover possible factors shaping collocation features of translated texts (Bernardini, 2007; Marco, 2009). These studies are reviewed in the following section.

### 2.4.2 Translating shifts and collocations in translated texts

Existing studies have compared collocations in translated texts with source texts, identifying linguistic choices made by or imposed on translators in the translating process. These linguistic choices are named shifts by Bernardini (2007) and techniques by Marco (2009). Marco (2009) suggested that the term technique is used because shifts indicate the dissimilarities between the source and the target texts. Nevertheless, the present study uses shifts to describe linguistic choices made by interpreters in the interpreting process, as shifts could also refer to the process of shifting between two languages. In comparison, the term techniques embed the meaning of strategically using collocations, though translators may have unconsciously used certain collocations. It needs to be noted that in the specific context of the present study, interpreting shifts cover both similarities and differences between the source and the target speeches. The working definition of interpreting shifts is specified in Section 3.4.

Analysing features of translation shifts accompanying the use of collocations in translated texts, previous studies discussed possible factors that are relevant to the use of collocations in translated texts. For instance, Bernardini (2007), as reviewed in 2.4.1, discovered that noun + prep/conj + noun collocations occurred more frequently in translated Italian than in non-translated Italian. To confirm that this collocational pattern is relevant to translation shifts, the author compared collocations in translated texts with their source texts and discovered that many noun + perp/conj + noun collocations were rendered from creative expressions in source speeches and became

more conventional and common in the target language. It is likely that translators used conventional collocations to make translated texts more understandable to target readers.

Marco (2009) compared phraseological units (collocations in a phraseological sense) in Catalan translated texts and English source texts, aiming to find out whether translated texts are more phraseological than source texts. It was observed that 55.28% of phraseological units in source texts were translated into phraseological units, 22.57% of phraseological units were translated into non-phraseological units, and 21.12% of the non-phraseological units were translated into phraseological units. The author then suggested a "narrow margin" phraseological loss in the translating process (Marco, 2009, p. 11). In explaining these findings, Marco (2009) argued that phraseological loss may be due to the typological differences between source and target languages. When the target language does not have a structural and semantic equivalence to phraseology in the source language, the translator can only paraphrase the meaning of the source texts with non-phraseological expressions to avoid information loss. In addition, Marco (2009) attempted to provide theoretical accounts of collocation features observed in translated texts from a cognitive perspective. Drawing on Halverson's (2003) gravitational pull hypothesis, Marco argued that in the process of translating, a semantic network in the translators' brains is activated by lexical and grammatical structures in the source texts. Within this semantic network, target language structures that are more salient or readily available in translators' mental lexicon will exert a gravitational pull and be produced in target texts, contributing to the overproduction of certain linguistic items in target texts (Halverson, 2003, p. 218). Marco (2009) suggested that to avoid risks, translators tend to use conventional collocations in target languages.

The above two studies reflect that the use of collocations in translation (and interpreting) is highly language specific. Findings in Italian and Catalan (particularly these are translators' L1) may bear little resemblance to Chinese-to-English interpreting. Adopting methods of these studies, i.e., comparing target with source speeches, the present study is able to uncover how collocations are rendered from source speeches by Chinese-speaking interpreters, which compensates for the limitation of comparing translated texts with non-translated texts in the same language (the monolingual comparison). Such comparison will shed light on possible factors influencing interpreters' use of collocations when working into L2 English.

So far, collocations in translation studies have been reviewed. When it comes to interpreting, the spoken form of translation, less research has been undertaken on collocations. Though translation and interpreting mainly involve similar processes: comprehending a text or a speech in one language and producing another text or speech in a different language (De Groot, 2000), translators and interpreters work in different circumstances. Working in a real-time and immediate communicative context, interpreters are subjected to higher cognitive load and time pressure than translators. Interpreters usually need to prepare in advance and have only one chance to produce speeches. In comparison, translators are allowed to consult reference materials while translating and can edit their works numerous times to satisfaction before submission (Gile, 2009). Therefore, what has been discovered in translation may not hold in interpreting. In the next section, empirical studies on the use of collocations in interpreted speeches are discussed.

### 2.4.3 The use of collocations in interpreting

As reviewed in 2.1, some studies have highlighted the importance of collocations in target speech production in simultaneous interpreting. For instance, Setton (1999) noted that at international conferences, the use of languages by speakers is highly conventional and collocational. By building a huge "phrasebook" containing ready-made collocations in the target language, professional conference interpreters can draw those collocations directly from the phrasebook, which increases the fluency of target speech production (Setton 1999, p. 278). In the same vein, Henriksen (2007) argued that the use of collocations helps reduce interpreters' production effort in simultaneous interpreting because collocations are retrieved from the memory as single words and save the effort of interpreters in combining words to formulate interpreted speeches. In addition to target speech production, Henriksen (2007, p. 7) suggested that interpreters' ability to recognise collocations in source speeches facilitates the listening and comprehension of source speeches and helps interpreters anticipate upcoming information in simultaneous interpreting. Moreover, according to Henriksen (2007), collocations make the language production in simultaneous interpreting more natural.

Only a few empirical studies have probed into the use of collocations in interpreting. An early endeavour was undertaken by Henriksen (2007), who explored how instances of formulaic

language in English and German political speeches were interpreted simultaneously into Danish in multilingual meetings at the European Commission and the Council of Ministers. The English and German source speeches contain 1763 and 2031 words, respectively. Comparing interpreted speeches with source speeches, Henriksen (2007) discovered that some interpreters recognised the meaning of source speeches and rendered them into similar formulaic sequences in the target language, in what Henriksen called "meaning-based interpreting" (Henriksen, 2007, p. 12). Henriksen explained that typical ideas expressed in formulas in the source speeches can be recognised by professional interpreters. However, different source text formulas are rendered into the same target language formulaic sequence, which increases the "homogeneity" of interpreted speeches (Henriksen, 2007, p. 12). Some interpreters, however, were influenced by the surface structure of the formulas in source speeches and tended to render them literally, in what Henriksen called "form-based interpreting" (Henriksen, 2007, p. 10). Henriksen's study provides evidence of the possible influence of the source speeches on interpreters' use of collocations.

Using corpus methods, two studies systematically investigated phraseologies and collocations in interpreted speeches produced in simultaneous interpreting, aiming to uncover typical collocation features of interpreted speeches as compared with non-interpreted texts/speeches (Dayter, 2019; Ferraresi & Miličević, 2017). Ferraresi and Miličević (2017) probed into phraseologies (collocations in the frequency-based approach's definition) in simultaneously interpreted speeches to uncover whether phraseological patterns of Italian-interpreted speeches (33,675 words), Italian-translated texts (36,876 words), non-translated Italian written texts (24,131 words), and non-interpreted Italian speeches (24,866 words) differed. The two authors first compared modifier + noun patterns and noun + modifier phraseologies in interpreted speeches with those in translated texts and then compared the same structures in interpreted and translated texts with those in non-translated and non-interpreted texts. The results showed that compared with translated texts and non-interpreted Italian speeches, interpreted speeches included less highly natural phraseologies (MI scores ≥7) but more unnatural phraseologies, indicating that interpreted Italian is less phraseologically conventional than non-interpreted speeches. In explaining these findings, Ferraresi and Miličević (2017) discussed the influence of the "underlying cognitive mechanism" (p. 23) of simultaneous interpreting. Citing Tremblay and Tucker (2011), Ferraresi and Miličević (2017) suggested that to ease the cognitive burden, interpreters may avoid using highly natural phraseologies that are less easily retrieved from the mental lexicon. In addition to

the cognitive restriction of interpreting, Ferraresi and Miličević (2017) discussed the possible influence of the source speeches. Since interpreters produce speeches simultaneously with speakers, they are likely to be interfered with by the surface structure of source expressions and produce unnatural collocations.

Dayter (2019) further expanded the research scope by comparing the frequency and complexity of thirteen types of collocations in a corpus of English speeches simultaneously interpreted from Russian with those in a corpus of English spontaneous speeches. Statistically significant results showed that with regard to the adjective + conjunction/preposition + adjective structure, interpreted speeches included a wider range of common collocations and more strongly associated collocations than spontaneous speeches. However, a narrower range of common collocations and less strongly associated collocations were identified in interpreted speeches in relation to verb + adverb and adverb + adjective structures. Dayter's (2019) findings indicate that a lack of collocation conventionality in interpreted speeches is specific to collocations with certain grammatical structures. When explaining these findings, Dayter (2019) mentioned the influence of source speech collocation transfer (named transcoding in Dayter's study) and the typological difference between Russian and English, suggesting that to ease the cognitive burden, interpreters tend to keep close to the surface structure of source speech collocations (Dayter, 2019, p. 73). However, Dayter (2019) also suggested that this kind of explanation cannot account for all findings, especially when it comes to the types of collocations that do not differ significantly in interpreted and non-interpreted corpora. The author then turned to Sinclairs' (1989) equalising universals hypothesis of interpreted speeches, which suggests that compared with non-interpreted speeches, interpreted speeches feature a higher degree of orality and a lower degree of literateness, i.e. interpreted speeches are more spoken than written.

In sum, previous studies have made attempts to investigate collocations in translated texts and interpreted speeches. Several typical collocation features of interpreted speeches and translated texts have been revealed. Compared with translation studies, collocations are less documented in interpreting studies. Existing interpreting studies have mainly focused on collocations in simultaneous interpreting. In contrast, consecutive interpreting, another mode of interpreting also used in a variety of settings (e.g. legal proceedings, political and business meetings, and doctor–

patient consultations), has not been investigated. Different from interpreters who listen to source speeches and produce target speeches at the same time in simultaneous interpreting, consecutive interpreters transmit the information after speakers complete a speech segment and pause (Russell, 2005). Working in different modes, interpreters may use collocations differently in interpreted speeches. Therefore, findings obtained in investigating simultaneous interpreting may not hold in consecutive interpreting.

In addition, Ferraresi and Miličević (2017) and Dayter (2019) discussed that collocations in interpreting may be influenced by similarities and differences between the source and the target language. The two studies imply that collocation features of interpreted speeches could be language-pair specific. Therefore, the findings of studies on Italian–English and Russian–English interpreting may not apply to Chinese–English interpreting. However, there has not been much investigation of collocations in Chinese–English interpreting.

Furthermore, though previous studies have mentioned the necessity of investigating source speeches in explaining collocation features observed in interpreted speeches, this method has not been operationalised, which makes most explanations speculative. Attempts have been made to explain findings by interpreting the universal hypothesis (Dayter, 2019), which assumes that interpreted speeches have common linguistic features that distinguish them from non-interpreted speeches. However, as discussed in Subsection 2.4.2, the universal hypotheses of translation and interpreting only describe potential common features that distinguish translated texts and interpreted speeches from non-translated/interpreted ones but cannot explain why those features exist. In explaining typical collocation features observed in interpreted speeches, one must consider multiple factors constraining interpreters' target speech production in the interpreting process.

The present study addresses the research gaps by investigating the use of collocations in Chinese-to-English consecutive interpreting. Source speeches are analysed to uncover factors influencing the use of collocations. In explaining its findings, this study draws on cognitive theories of

consecutive interpreting and models of late bilinguals' mental lexicon and the co-activation of L1 and L2 in L2 production, which are reviewed in the next section.

## 2.5 Cognitive processes of consecutive interpreting

As reviewed in Subsection 2.3.2, the co-activation of English learners' L1 and L2 and the order/age of acquisition effect may influence English learners' processing and production of English collocations. These explanations are grounded in models of SLA studies and interpreting, which shed light on the present study. Chinese-to-English consecutive interpreting involves the processing of two languages, requiring Chinese-speaking interpreters to process Chinese and English as the output alternately. During this process, as ESL learners, interpreters in the present study are subject to the influence of collocations stored in their English mental lexicon (i.e., lexical representations in long-term memory) and the co-activation of Chinese and English, which may influence how interpreters use collocations.

Nevertheless, models proposed by SLA studies may not account for all collocation features observed in interpreted speeches because, in addition to processing two languages, interpreters need to allocate attention to various tasks when producing target speeches, such as recalling the message in the source speech and reading notes. To avoid cognitive saturation, interpreters need to allocate cognitive resources efficiently to different tasks in the interpreting process. Previous studies have suggested that since collocations are directly drawn from the mental lexicon, the use of collocations helps interpreters unburden the cognition in interpreting (e.g. Eyckmans, 2007; Plevoets & Defrancq, 2018; Van Rietvelde et al., 2010). Therefore, collocation features of interpreted speeches may also reflect how interpreters efficiently manage the limited cognitive resources in the interpreting process.

This section provides an overview of cognitive processes relevant to collocation use in Chinese-to-English consecutive interpreting. Two conceptual models in SLA and interpreting studies are introduced in the first two subsections: late bilinguals' mental lexicon and the co-activation of the source and the target language systems in interpreting. In Subsection 2.4.3, a core mechanism that is assumed to be the recipient of the aforementioned cognitive burden, i.e. working memory,

is introduced. The last part of this section reviews theories on how interpreters allocate cognitive resources efficiently to avoid overloading the working memory in the interpreting process.

### 2.5.1 Late bilinguals' mental lexicon

Mental lexicon is a concept in modelling and understanding how words are stored, organized, and accessed in language users' cognition (Jarema & Libben. 2007). During the target speech production in Chinese-to-English consecutive interpreting, interpreters need to draw collocations from their English mental lexicon. In this regard, how collocations are organised in interpreters' mental lexicon would influence their use of these collocations. In SLA studies, several theoretical models have been proposed to conceptualize English learners' L2 mental lexicon and its relation with L1 mental lexicon (e.g. Kroll & Stewart, 1994; Paivio & Desrochers, 1980). Among these theoretical models, Kroll and Stewart's (1994) Revised Hierarchical Model (RHM) of late bilinguals' mental lexicon integrates models proposed by previous studies and is supported by abundant empirical studies. This model conceptualises the mental lexicon of late bilinguals who acquire the L2 after the age of 6 or 7, especially when in adolescence or adulthood (Kroll et al., 2010, p. 373). These late bilinguals have their L1 as the dominant language. The ESL learners, EFL learners, and English learners discussed in the previous sections are all late bilinguals in the RHM. In the present study, trainee interpreters are advanced English learners who acquired English after early childhood. Therefore, trainee interpreters are late bilinguals.

The RHM is based on the theory of cognitive grammar (Langacker, 1987), which posits that all linguistic items consist of two symbolic structures: the surface structure and the meaning. Both structures are represented cognitively. The surface structure of linguistic items is either graphemic or phonological and is stored in language users' mental lexicon. The meaning of linguistic items, or conceptual content, is stored in language users' minds as conceptual memory (Langacker, 1987, pp. 99–146). These conceptual contents are pure messages without linguistic forms. The surface structure of linguistic items symbolises the meaning. When producing a language, language users build up a connection between the concept that they would like to express and a phonological or graphemic symbol by looking for "an appropriate target structure that 'fits' a sanctioning unit within some degree of tolerance" (Langacker, 1987, p. 77).

When it comes to linguistic items stored in late bilinguals' mental lexicon, the RHM suggests that surface structures of late bilinguals' (English learners) L1 and L2 are stored separately in the mental lexicon, sharing the same conceptual memory (Fig. 2.1) (Kroll & Stewart, 1994).

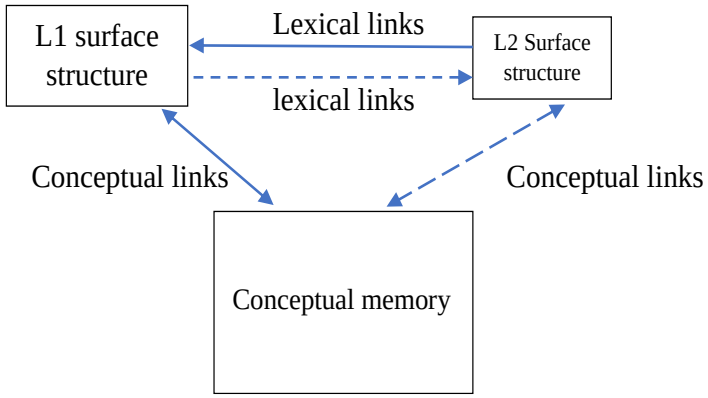



Figure 2.1: Revised hierarchical model of structural and conceptual representation in late bilinguals' mental lexicon (adapted from Kroll and Stewart, 1994, p. 158)

According to Kroll and Stewart's model (1994), surface structures of a late bilingual's L1 lexicon and L2 lexicon are bidirectionally connected by lexical links based on word-for-word translation equivalents (see also Potter et al. 1984). However, the connection from L2 to L1 is stronger than from L1 to L2, as illustrated by the solid and dotted arrows. This means when acquiring the L2, late bilinguals tend to associate L2 words with their L1 translations, which makes the connection from the L2 lexicon to the L1 lexicon strong and active (Kroll and Stewart, 1994).

In addition to the lexical links between late bilinguals' L1 and L2 surface structures, the RHM assumes that both L1 and L2 lexicons are linked to conceptual memory. In addition, the conceptual link between the surface structures of late bilinguals' L1 and the conceptual memory is stronger than that between the L2 and concepts (as shown by the solid and the dotted lines). When acquiring L2 lexes, late bilinguals may associate L2 surface structures with L1 surface structures through the lexical links rather than directly connect the L2 lexicon with the conceptual memory. Furthermore, since late bilinguals acquire L1 before L2, it is assumed that their L1 mental lexicon is larger than the L2 mental lexicon, as shown in the larger square of L1 surface

structures in Fig. 2.1. Thus, when producing L2, late bilinguals may encounter difficulties in finding an L2 linguistic surface structure for a concept that they want to express. Instead, they may resort to the L1 surface structure and adopt a word-for-word translating strategy to produce L2 (Kroll & Stewart, 1994).

The RHM reflects the mental lexicon of English learners, suggesting that even proficient English learners may need to access meaning via L1 translation equivalents when using English (Thierry & Wu, 2007). The model is supported by experiments reporting asymmetrical cross-language priming effects. Participants of these experiments are all late bilinguals who learned their L2 after early childhood. Cross-language priming occurs when English learners recognise an L2 word faster when presented with an L1 translation or a semantically related L1 word of the L2 word than with a nonrelated/non-translated L1 word. It has been found that cross-language priming only occurs when an L2 word is primed with L1 translations or L1 semantically related verbs (e.g. Davis et al., 2010; Dimitropoulou et al., 2011). In comparison, no such priming effect is observed when English learners are presented with L2 semantic-related words and L2 translations of L1 words before the L1 words in experiments (Jiang & Forster, 2001). The asymmetrical priming effect suggests that accessing the L2 lexicon (i.e. associating the L2 lexicon with the conceptual memory) can be facilitated by the mediation of L1. However, when it comes to the recognition of L1 words, there seems to be no significant facilitation from English learners' L2. Such findings indicate a stronger lexical link from English learners' L2 to L1 than from L1 to L2 mental lexicon. In addition, the link between L1 mental lexicon and the conceptual memory is stronger than the link between L2 mental lexicon and the conceptual memory, as predicted by the RHM.

Interpreters are late bilinguals. Previous studies have investigated features of interpreters' L1 and L2 mental lexicon. These studies mainly compared professional and trainee interpreters with late bilinguals who have not received interpreting training, focusing on their speed of retrieving words from the L1 and L2 mental lexicon. For instance, Christoffels et al. (2006) compared the speeds in picture naming in L1 and L2 of professional interpreters and late bilinguals. The 13 professional interpreters are L1 Dutch users who have been working into English and have on average 16 years of professional experience. The late bilinguals include 39 non-interpreting university students who have been ESL learners for at least six years, starting at age 12 at

secondary school, and 15 English teachers who were teaching at the higher levels of secondary education in Netherland and have on average 19 years of experience teaching English. Results show that the interpreters and English teachers were similar, but university students were significantly slower in picture naming in L2. Such finding indicates that interpreters, who are advanced English learners as English teachers do, are more proficient in retrieving words from their L2 mental lexicon. This means the link between interpreters' L2 mental lexicon, and their conceptual memory may be stronger than that between less advanced English learners'. In addition, Christoffel et al.'s (2006) study reveals that the three groups of participants were similar in their speed of picture naming in L1 and were all faster than they were in picture naming in L2. This means interpreters may still find it more difficult to retrieve words from their L2 than from L1 mental lexicon, which corroborates with the RHM model's suggestion that the L2 mental lexicon of advanced English learners may still be smaller than their L1 mental lexicon.

In another study, Chmiel (2018) compared 20 trainee interpreters before and after a two-year graduate programme in conference interpreting, 24 professional conference interpreters and 24 ESL students in a master's programme in English. The three groups of participants took part in semantic priming experiments. Results show that all three groups were slower in recognising L2 than L1 words, indicating a weaker connection between the L2 mental lexicon and the conceptual memory. Since no statistical significance was found among the three groups in their speed of recognising L2 words, Chmiel (2018) suggests that interpreter training and professional experience may not change the difference between late bilinguals' L1 and L2 mental lexicon regarding their connection with the conceptual memory. In addition, the asymmetrical priming effect was observed in all participant groups, indicating that interpreter training or interpreting experience may not alter the stronger link from interpreters' L1 to their L2.

In the context of the present study, Chinese trainee interpreters are late bilinguals who have received interpreter training in the UK for at least one year. It is likely that what has been found by Christoffels et al. (2016) and Chmiel (2018) also hold for the Chinese trainee interpreters. When drawing collocations from the mental lexicon, these interpreters are potentially influenced by the stronger lexical links from English to the Chinese mental lexicon, the weaker conceptual

link between English and the conceptual memory, as well as the size of the English mental lexicon. All these factors may shape the collocation features of interpreted speeches.

This subsection reviews how two language systems are organised in late bilinguals' memory, stressing that L1 and L2 lexical items are stored separately in the mental lexicon, sharing the same conceptual memory. This gives rise to the interesting questions of how, when it comes to L2 production, late bilinguals control the two language systems and select the language they intend to produce, and how, in consecutive interpreting, where interpreters need to listen to the source speech in one language and produce the target speech in another, interpreters access the two language systems. The next subsection reviews theoretical accounts of how interpreters switch between the two languages through language control and how the source language may interfere with the production of the target language during the language switching process.

### 2.5.2 Language control and source language interference in interpreting

In consecutive interpreting, interpreters switch between listening to source speeches in one language (the source language), and delivering target speeches in another language (the target language) every few minutes. To successfully produce purely interpreted speeches that do not include any source language elements, interpreters must have the situationally appropriate phonological, lexical and syntactic elements of the target language activated, and have the source language mental lexicon suppressed (De Groot & Christoffels, 2006; Hervais-Adelman & Babcock, 2019). The cognitive process of inhibiting and activating language systems in interpreting is named language control by some scholars (Christoffels & De Groot, 2005; De Groot & Christoffels, 2006; Dong & Li, 2020).

When it comes to how language control is achieved in interpreting, several theoretical accounts have been provided, particularly on simultaneous interpreting (Paradis, 1994, 2004; Grosjean, 1997; Christoffels & De Groot, 2005). Among these theoretical accounts, Christoffels and De Groot's (2005) model of language control in simultaneous interpreting (Fig. 2.2) is based on models proposed by previous scholars (Grosjean, 1997; Paradis, 1994, 2000). According to the two authors, during simultaneous interpreting, interpreters need to produce the target language while listening to the source language. The reason why the target language instead of the source

language is produced is because interpreters' two language systems are co-activated, though they are co-activated to different degrees during different phases (listening and producing) of interpreting.

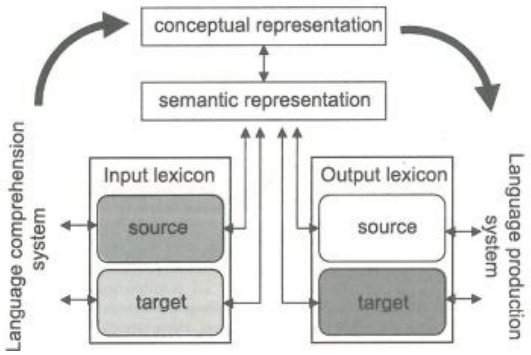



Figure 2.2: Language control in simultaneous interpreting (Christoffels & De Groot, 2005, p. 473)

Figure 2.2 illustrates the language control mechanism at the lexical level in simultaneous interpreting. The input lexicon and the output lexicon refer to words in source and target speeches respectively. When comprehending the source language (the input lexicon), interpreters have their source and target language systems co-activated. However, the source language system is activated to a larger extent than the target (illustrated by the darker grey of the source subset in the input lexicon), enabling interpreters to comprehend source speeches with their language comprehension system. Having comprehended the source language, interpreters convert the words they hear to conceptual and semantic representations in their cognition. Then, they express conceptual and semantic representations in the target language (output lexicon) with their language production system. During the production of the target language, the source language system is strongly inhibited, as shown by the square with no colour in the output lexicon box, so that only the target language will be produced.

The co-activation of the source and the target language systems proposed in Christoffels and De Groot's model (2005) sheds lights on how the two languages may be controlled in consecutive interpreting. Though consecutive interpreters only begin to render the source speeches into the target language after the speaker stops speaking, which gives them time to inhibit the source language system and activate the target language system, they may be in a situation where both language systems are activated. Such a co-activation can be manifested by the notes of consecutive interpreters. As revealed by previous studies, interpreters' notes include both the

source and the target language (Chen, 2022; Szabó, 2006). While comprehending the source language, consecutive interpreters may note down the source information in the target language, which can only be achieved when the target language system is activated. When producing the target language, interpreters may read the source language in notes, with their source language system activated.

Given the two language systems are co-activated, consecutive interpreters need to monitor whether the source language system interferes with their target language production (Dailidėnaitė & Volynec, 2013; Lamberger-Felber & Schneider, 2008). Otherwise, under the interference of the source language system, they would produce unnatural target language expressions with lexical and syntactical features of the source language (Chmiel et al., 2020). In interpreting studies, interference used to be perceived by some scholars as the contamination of the target speech by the source language (Pöchhacker, 1994). But in more recent studies, interference is considered as the auditory and/or visual influence of the source language on syntactic structure and/or elements of interpreted speeches (Chmiel et al., 2020; Lamberger-Felber & Schneider, 2008). It can either facilitate or hinder the natural production of interpreted speeches.

Empirical studies have been conducted on how the source language interferes with the production of interpreted speeches, mainly discovering two types of interference, namely, lexical interference and structural interference. Lexical interference was examined based on words that exist across the source and the target languages, namely cognates and homographs. Cognates are words that are both phonologically and semantically similar in two languages (Costa et al., 2005), whereas homographs are words that share the forms but with different meanings in two languages (Otwinowska, 2016; Shlesinger & Malkiel, 2005). It was discovered that interpreters translate cognates faster than translating homographs in English-to-Hebrew (Shlesinger & Malkiel, 2005), Dutch-to-English and English-to-Dutch (Christoffels et al., 2006), and English-to-German and English-to-Polish (Lijewska and Chmiel, 2014) word translation experiments. In addition, it was revealed that interpreters produced cognates more frequently in English-to-Hebrew simultaneous interpreting than in translation, which may have helped them to ease the cognitive burden in interpreting (Shlesinger & Malkiel, 2005). Such findings echo findings of psycholinguistic studies that cognates are processed faster than homographs and can facilitate the comprehension and production of languages (Costa et al., 2005; Hoshino & Kroll, 2008; Starreveld et al., 2014).

Though the facilitation effect of cognates is discovered in interpreters' language production, it may not be applied to the present study, because unlike words belonging to the same language family of English, Chinese shares very little cognates with English.

Compared with lexical interference, structural interference is more relevant to the present study. It occurs when the source language's syntactic structure is reproduced in interpreted speeches, even if the syntactic structure does not exist in the target language (Maier, 2009). To avoid the negative influence of structural interference from the source language, interpreters usually take strategies by re-ordering the source speech structure (Ma & Cheung, 2020; Wang & Zou, 2018). Evidence of structural interference from the source language in interpreting was provided by corpus-based studies. For instance, Wang and Zou (2018) discovered that 19% of complex front-loaded, attributive modifying structures in Chinese were kept in English interpreted speeches in Chinese-to-English consecutive interpreting undertaken by professional interpreters, though these front-loaded structures are complex for the target language norms. Such a finding indicates the possible structural interference from the front-loaded structure of the source speech. In another corpus-based study on source language interference in English-to-Chinese simultaneous interpreting, Ma and Cheung (2020) focused on the interpretation of English passive voice structures, which are used less frequently in Chinese. It was uncovered that 29% of passive structures in English source speeches were kept by professional interpreters in simultaneous interpreting with text, and 27% were reproduced in simultaneous interpreting without texts. The reproduction of passive structures in interpreted speeches reflects the possible interference from the source language.

In the present study, the use of collocations by Chinese-speaking trainee interpreters in interpreted speeches may also be subject to the interference from the source language. As reviewed in 2.3.2, typical collocation features observed in L2 English indicate the influence of English learners' L1. In Chinese-to-English consecutive interpreting, such an interference may stem from either source speeches at the textual level, or from the structure of expressions stored in the Chinese mental lexicon of interpreters.

In addition to the late bilingual memory and the co-activation of two language systems, consecutive interpreting is cognitively challenging because it involves multiple tasks requiring

the interpreter's processing capacity. Sometimes, multiple tasks require more processing capacity than is available (Gile, 2009). When the processing capacity available for a particular task in consecutive interpreting is not sufficient at a given time, the interpreters' processing capacity will be saturated (Gile, 1995, p. 171). Consequently, the interpreting performance may deteriorate (Gile, 2009, p. 159). In cognitive psychology, the saturation of processing capacity is assumed to be imposed on one's working memory (e.g. Paas et al., 2003). In the following subsection, concepts relating to working memory are described.

### 2.5.3 Working memory and consecutive interpreting

#### *The Model of Working Memory*

In cognitive psychology, memory refers to a cognitive system that encodes, stores and retrieves information (Eysenck, 2001). The term "working memory" was originally introduced by Baddeley and Hitch (1974) to refer to "an integrated system involving both temporary storage and attentional control, a system that supports a wide range of cognitive processes and tasks" (Baddeley, 2017, p. 301). This term was introduced based on the then prevalent definition of short-term memory, concerning "the simple retention of small amounts of information, tested either immediately or after a short delay" (Baddeley, 2009a, p. 19). Compared with short-term memory, which was assumed to deal with the storage of information to be passively recalled, working memory is a more complex system that can process information and perform tasks such as reasoning, learning, and comprehension.

In their working memory model, Baddeley and Hitch (1974) outlined the possible structure of working memory. Since its introduction in 1974, this model has been continuously tested and adapted by Baddeley and colleagues (e.g. Baddeley, 1992; Baddeley, 2000; Baddeley, 2017; Gathercole and Baddeley, 2014). Though there are ongoing debates on the components of working memory and functions of the components (e.g. Andrade, 2001; see a review in Baddeley, 2010), the notion of working memory and relevant concepts such as the central executive, attention allocation, and the decay of working memory have been applied to language acquisition and processing studies, as well as translation and interpreting studies (e.g. Ellis, 1996; Mizuno, 2005; Tokowicz et al., 2004; Wen et al., 2015). In the latest version of the working memory model, Baddeley (2017, p. 307) showed the hierarchical relation among components of working

memory (Fig. 2.4). As illustrated in Figure 2.4, working memory includes a central executive, coupled with a subsystem, and episodic buffer[6], followed by two other components: the visuo-spatial sketchpad (VSSP) and the phonological loop.

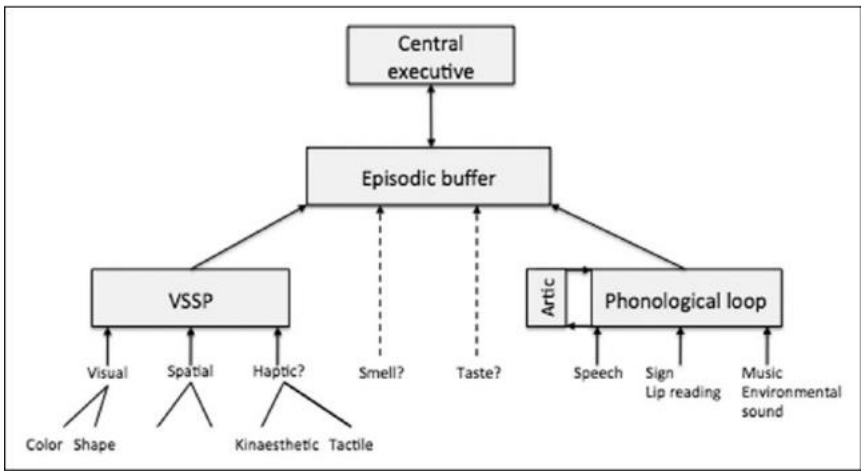



Figure 2.3 The model of working memory, adapted from Baddeley and Hitch (1974) by Baddeley (2017, p. 307). VSSP refers to the visuo-spatial sketchpad

The phonological loop and VSSP are two subsystems that process and temporarily store acoustic and visual representations (Baddeley, 2009b, p. 44; Baddeley, 2017). As illustrated in the model, the VSSP is assumed to integrate visual (e.g. colour and shape), spatial, and possibly haptic information (e.g. kinaesthetic and tactile information) into a unified representation and temporarily store the visuo-spatial representation (see also Baddeley, 2003). Another component, the phonological loop, can combine subvocal acoustic information, such as speech, lip readings, music, and environmental sound into auditory-verbal information and temporarily store the information (Baddeley, 2009b; Baddeley, 2017). The phonological loop is also responsible for language processing and production (Baddeley et al., 1998).

Auditory-verbal and visuo-spatial information processed and temporarily stored in the phonological loop and VSSP is further combined and stored in the episodic buffer, which is considered a limited storage capacity system that connects VSSP and phonological loop with the central executive. The episodic buffer is assumed to integrate information stored in VSSP and phonological loop into "multidimensional representations", or episodes (Baddeley, 2003, p.202).

[6] The episodic buffer was later added to the original model of Baddeley and Hitch (1974) by Baddeley (2000).

Information in quantities that exceed the capacity of the phonological loop and VSSP and other information such as smell and taste may also be temporarily stored in the episodic buffer (Baddeley, 2000).

Another component of working memory is the central executive. As an "attentionally limited system" (Baddeley, 2017, p. 302), the central executive controls the allocation of attention and coordinates the working memory system (Baddeley, 1996). The cognitive functions of the central executive include attention focus, attention division, and attention switching (Baddeley, 1996; Norman and Shallice, 1986). Attention focus refers to the ability to allocate attentional resources to one set of cognitive processes while inhibiting others (Logie, 2016; Robbins et al., 1996). For example, an individual can concentrate on reading books even amidst distracting noises. The second function, attention division, means processing multiple tasks concurrently (Baddeley, 2009b; Logie et al., 2004). Driving and speaking on the phone at the same time is an act of attention division (Baddeley, 2009b, p. 55). The concept of attention division assumes that there is one overall pool of attentional capacity that can be allocated with multiple tasks performed at the same time (e.g. Naveh-Benjamin et al., 2014). Each task is assumed to receive a limited amount of attentional capacity, and if one task is allocated with all the capacity, the performance of other tasks will deteriorate. The element of third executive capacity is attention switching, which means directing the attentional capacity from one task to another (Baddeley, 2009).

***Working memory and long-term memory***

In addition to the above-mentioned four components, working memory is believed to be connected with another memory system: long-term memory (Baddeley and Hitch, 1974; Baddeley, 2009b; Baddeley, 2017). Long-term memory is assumed to be "a system or systems that store information over long periods of time" (Baddeley, 2009b, p. 10). Long-term memory stores information that may not be in use at the moment for a specific task but possesses pertinent retrieval cues (Mizuno, 2005, p. 742). Long-term memory is believed to be responsible for storing "knowledge of the world" (Baddeley, 2009c, p. 11), sensory information (e.g. tastes, colour, smell), specific events or episodes (e.g. someone's death), and language (Baddeley, 2009c). The surface structure of languages, semantics, and other linguistic resources are also assumed to be stored in long-term memory (Baddeley, 2009c). Working memory and long-term

memory are assumed to be in constant interaction when one performs cognitive tasks, which the central executive further monitors through the episodic buffer (Baddeley, 2009c). In performing cognitive tasks, the episodic buffer is assumed to be able to combine temporarily stored information with that from long-term memory into integrated chunks. Information temporarily stored in the episodic buffer may also be further stored in long-term memory.

***Working memory and consecutive interpreting***

Consecutive interpreting is a cognitive task that places great demands on working memory. First, the multitasking aspect of consecutive interpreting requires the maximal use of the central executive. In consecutive interpreting, interpreters need to listen to and comprehend source speeches, take notes, temporarily store source information in the working memory for later recall, retrieve the source information from the working memory, read notes, and formulate speeches in another language (Gile, 2009, p. 176). Some of those tasks need to be done concurrently, requiring attention division by interpreters. For instance, when listening to source speeches, interpreters need to devote attention to taking notes. In producing target speeches, interpreters must also allocate attention to recalling information temporarily stored in the episodic buffer, recognising the visual information of notes with the VSSP system, and retrieving target language expressions from the long-term memory (including the mental lexicon). In addition to attention division, consecutive interpreting involves attention focus and attention switching. For instance, when the speaker stops speaking, interpreters need to switch attention from listening and comprehension tasks and focus attention on recalling information and target language production.

In consecutive interpreting, interpreters may be constantly facing the risk of saturating the capacity of the central executive (Gile, 1995, p. 171). For instance, if interpreters encounter processing difficulties in tackling certain tasks, such as failing to recognise notes or being unable to retrieve appropriate expressions from long-term memory, they may need to allocate extra attention to tackle those problems. This may occupy the attention that should be allocated to other concurrent tasks that should be completed timely, such as recalling source information, which may influence the quality of interpreted speeches (see a similar discussion of simultaneous interpreting in Mizuno, 2005). If two or more tasks are poorly coordinated and compete for

resources within the central executive, this competition could also influence the production of interpreted speeches.

In addition to its demands on the central executive, consecutive interpreting is cognitively challenging because of the limited storage capacity of interpreters' working memory. Working memory capacity refers to "the amount of information an individual can hold in mind at one time" (Cowan, 2008, p. 324). Baddeley et al. (1975) investigated the immediate recall of sequences of five words ranging in length from one syllable to five syllables and discovered that participants' response time became slower as the word length expanded. The researchers suggested that longer words take longer to recall and are more likely to decay in the working memory with time (Baddeley, 2007). Despite counterevidence and ongoing debates on the nature of the limited capacity of working memory (e.g. Cowan, 2010), it is generally accepted that working memory can only store a limited amount of information for a limited length of time (e.g. Cowan, 1999; Portrat et al., 2008; Zhang & Luck, 2009). In consecutive interpreting, phonological, lexical-semantic, syntactic, and other representations of the source and the target language are stored in working memory for further processing (Mizuno, 2005). Working memory serves as a buffer for interpreters to comprehend and produce languages, especially when there is a time lag between interpreters hearing the source speech and producing the target speech. However, interpreters also face the challenge of being unable to memorise the source information or the decay of source information stored in the working memory system.

Based on current theoretical accounts of the human memory system, interpreters may be constrained by the limited storage capacity of working memory subsystems and the limited processing capacity of the central executive. These cognitive constraints require interpreters to efficiently allocate attention to different tasks and store information in the working memory subsystems (Mizuno, 2005). Specifically, interpreters need to avoid overloading the central executive by efficiently coordinating various tasks. Additionally, interpreters need to store information in a way that minimises the chances of information loss and retrieve information before memory decay.

The limited capacity of interpreters' working memory may influence how they use collocations in consecutive interpreting. As reviewed in Section 2.1, collocations are processed faster in language comprehension and production. In simultaneous interpreting, collocations in interpreted speeches have also been found to alleviate the cognitive burden of interpreters and promote fluent target speech production. It is likely that in Chinese-to-English consecutive interpreting, trainee interpreters make use of English collocations to facilitate attention allocation and manage the limited storage capacity of working memory subsystems. In this regard, the theoretical model of working memory may help explain collocation features observed in the interpreting corpus.

## 2.6 Summary

This chapter reviews studies on collocations in L2 English, translation, and interpreting. Theories of late bilinguals' mental lexicon, language control in interpreting, and working memory, which constitute the theoretical framework of the present study, are also introduced.

As reviewed in Section 2.1, the importance of collocations is recognised in L2 English acquisition and interpreting. In L2 English acquisition, the use of collocations helps English learners reach L1-like naturalness. In interpreting, collocations have been shown to potentially ease the cognitive load of interpreters and promote fluent targt speech production.

Section 2.2 reviews previous methodological approaches to collocations in the field of linguistics and identifies three approaches, which helps clarify the notion of collocations and its relevance with other terms for formulaic sequences, such as phraseology and lexical bundles. The phraseological approach defines collocations by their semantic transparency and fixedness; the frequency-based approach views collocations as frequent co-occurrences of lexical items that can be extracted quantitatively with corpus methods; the structural approach sees collocations as the combination of lexis and grammar. All three approaches shed light on the present study in extracting collocations from corpora, which is further addressed in Chapter Three.

Since the present study focuses on collocations in English-interpreted speeches produced by Chinese-speaking interpreters, Section 2.3 reviews typical collocation features of L2 English uncovered by SLA studies. Though different studies adopt different approaches to defining collocations, making it hard to compare findings, a general picture emerges that L2 English users underperform L1 English users in spoken and written English with regard to the overall frequency, diversity, and complexity of collocations they use. Making use of a limited range and a limited number of collocations and more common collocations, English learners show a tendency to be conservative in their collocation use, which may be further related to the risk-avoidance strategy of English learners. English learners were also discovered to use unnatural collocations that L1 English users do not normally use. In addition to typical collocation features of L2 English, some studies have attempted to provide theoretical accounts of the factors influencing the use of L2 English collocations, among which the influence of L1 is supported by more empirical evidence. The co-activation of learners' L1 and L2 and the influence of learners' L1 on their acquisition of L2 collocations are assumed to influence the use of L2 collocations.

Compared with those in L2 acquisition studies, collocations in translation and interpreting research have been under-investigated. As reviewed in Section 2.4, some corpus-based translation studies have compared corpora of translated texts with corpora of non-translated texts in the same language and have revealed that translated texts include more collocations but a smaller range of collocations than non-translated ones. In explaining findings, most studies have attributed them to the translation universals hypothesis and have not specified factors constraining translators' use of collocations. Some researchers have attempted to uncover how the translation process influences the use of collocations in translated texts by analysing translating shifts. However, these studies did not specify on exactly what factors may have led to the typical collocation features of translated texts, leaving research findings underexplained. Regarding collocations in interpreting, a few studies have compared the collocation features of simultaneously interpreted speeches with spontaneous speeches and translated texts in the same language, revealing that interpreted speeches are less collocationally conventional than translated texts and spontaneous speeches with respect to the complexity and naturalness of collocations. Existing studies have focused on collocations in simultaneous interpreting, whereas consecutive interpreting, another common mode of interpreting remains unexplored. Moreover, typical collocation features identified in interpreting corpus remain underexplained. For instance, though

some studies have identified unnatural collocations in interpreted speeches, features of those unnatural collocations remain unknown, which makes it difficult to explain why unnatural collocations occur in interpreted speeches. In addition, similar to translation research, some studies have explained findings with reference to the interpreting universals hypothesis, without considering the influence of the interpreting process.

To understand factors influencing interpreters' use of collocations in Chinese-to-English consecutive interpreting, the present study draws on cognitive theories of late bilinguals' mental lexicon, language control and source language interference in interpreting and working memory. In Section 2.5, three theoretical models, i.e. the revised hierarchical model (RHM) (Kroll & Stewart, 1994) in L2 acquisition studies, the language control model of interpreting (Christoffels & De Groot, 2005), and the model of working memory (Baddeley & Hitch, 1976; Baddeley, 2017) in cognitive science, and relevant empirical studies are reviewed. The three theoretical models are combined in this study because previous studies have demonstrated that English learners' L1 influences their use of English collocations, and consecutive interpreting involves lexical retrieval from the mental lexicon and processing of two languages. Moreover, multitasking in consecutive interpreting poses challenges to interpreters' working memory systems. Since previous studies have noted that interpreters use collocations to ease the burden of working memory during simultaneous interpreting, the use of collocations in consecutive interpreting may also be relevant to the mechanism of interpreters' working memory. These three models are used to explain the findings in the discussion chapter.

# Chapter Three. Methodology

This study adopts a corpus-based approach to investigate trainee interpreters' use of collocations in Chinese-to-English consecutive interpreting, as application of machine-readable corpus and corpus query tools makes it possible to quantitatively identify collocations in interpreted speeches. In this chapter, overall considerations regarding the corpus-based method adopted and how research questions are addressed with this method are presented in Section 3.1. Section 3.2 covers the design of corpora, the corpora compilation process and corpora size. The extraction and analysis procedures of collocations are explained in Section 3.3. Section 3.4 outlines the procedure for identifying and analysing interpreting shifts. Finally, this chapter concludes with a summary in Section 3.5.

## 3.1 The corpus-based approach

With the development of computer technology, it becomes possible to store large quantities of texts of various languages, be they written or spoken, in a principled manner in the computer and to investigate the general features of those texts with the analysis tools (Renouf, 2007; Bendazzoli, 2018). The collection of machine-readable texts sampled to represent a language under consideration is named a corpus (McEnery & Wilson, 2003, p. 24). In the early 1990s (e.g. M. Baker, 1993), the corpus analysis method was adopted to investigate the linguistic features shared by translated texts in translation studies (e.g. M. Baker, 1993). Now, corpus-based research has become a well-established branch of translation studies (Bendazzoli & Sandrelli, 2005; Bernardini, 2015).

Compared with corpus-based translation studies, corpus-based interpreting studies as a discipline is still in its infancy, in what Setton (2011, p. 34) refers to as "a cottage industry". This is partially because compiling interpreting corpora is more time-consuming and challenging than compiling written translation corpora. Unlike written texts which can be directly compiled into corpora, spoken language is transitory and needs to be recorded and transcribed for corpora compilation. Moreover, many interpreting activities' audio or video files are kept confidential and not easily accessible (Metzger & Roy, 2011; Niemants, 2012). As is illustrated by Bendazzoli and Sandrelli (2005), several interpreting corpora are established based on one interpreter's output in a single conference, whereas others are not readily suitable for automatic extraction of occurrences and can only be analysed manually (e.g. Vuorikoski, 2004; Sergio, 2007). This means that research

using those corpora cannot fully exploit the potential provided by corpus analysis tools that have already been widely used in corpus-based translation studies (Bendazzoli & Sandrelli, 2005). Another factor limiting the development of corpus-based interpreting studies is that corpus-based research is product-oriented and can only uncover the linguistic features of source and target speeches at the textual level. However, corpus methods alone cannot explain research findings. Considering the conditions of target speech production in interpreting, scholars in interpreting studies are more interested in cognitive and psycholinguistic processes of interpreting because interpreting is cognitively and temporally constrained and is more interpersonal and interactive compared with translation. For some scholars, it seems pointless to focus on the linguistic features of interpreted speeches without considering the interpreting process (Setton, 2011).

Despite the methodological challenges encountered in corpus compilation and the limitation in explaining research findings, corpus-based interpreting studies as a research paradigm have been pursued by many scholars over the last two decades (Cencini, 2000; Shlesinger, 2008, Russo, Bendazzoli & Defrancq, 2018). One of the reasons is that by analysing interpreted speeches, researchers are able to test hypotheses derived from theories of interpreting, such as the Effort Model of interpreting (Gile, 1999; Gile, 2021; Setton, 2011). Moreover, by comparing the linguistic features of interpreted speeches with non-interpreted speeches with the aid of corpora, one can understand how interpreting, as a type of multilingual communication, is restricted by cognitive, social, or ideological factors, as compared with monolingual communication.

The present study aims to investigate collocation features of interpreted speeches. Therefore, to answer the three research questions proposed in Chapter One, the paradigm of corpus-based interpreting study is adopted. As presented in Chapter One, the first research question is: *Do collocations in interpreted speeches differ from those in L1 English spontaneous speeches with regard to frequency, diversity, and complexity?*. To answer this question, the present study constructed a corpus of speeches interpreted from Chinese into English by trainee interpreters and a corpus of spontaneous speeches produced by L1 English speakers and compared collocations extracted from those two corpora. To answer the second research question: *What characterises unnatural collocations in interpreted speeches?*, the researcher analysed features of unnatural collocations in the interpreting corpus with a reference corpus of contemporary L1 English and dictionaries of contemporary English, and complemented the analysis with human rating to

increase the reliability of results. Regarding the third research question, i.e., *What factors may have led to typical collocation features identified in addressing RQ 1 and RQ2?*, this study constructed a parallel corpus by aligning the interpreted speeches with Chinese source speeches. Then, Chinese source speeches of English collocations in interpreted speeches are analysed to identify interpreting shifts. In the next section, the corpora used in this study are introduced.

## 3.2 The Corpora

### 3.2.1 The design of corpora

Before introducing the three corpora employed in the present study, it is necessary to introduce two types of commonly used corpora in corpus-based translation and interpreting studies: parallel corpus and comparable corpus. The two types of corpora have their advantages and disadvantages and can be used for different purposes. To investigate features that distinguish translated/interpreted texts/speeches from non-translated/non-interpreted texts/speeches, researchers usually compare corpora of translated texts or interpreted speeches with comparable corpora (M. Baker, 2007; Dayrell, 2007; Dayrell, 2008). A comparable corpus is made of non-translated/interpreted texts collected under the same sampling frame, i.e., the same genres, language, topics, and lengths with translated/interpreted texts it compares with, hence the name comparable (McEnery & Xiao, 2008).

Though comparable corpora help identify common features of interpreted speeches, those features are difficult to explain based on comparable monolingual corpora only. Concentrating on interpreted speeches only, comparable corpora do not include source speeches. Hence, it cannot help examine possible reasons of typical collocation features of interpreted speeches, such as the influence of the source language (McEnery & Xiao, 2008). To explain typical features observed in comparable corpora, researchers have to use parallel corpora as complementary resources. Having assessed features of an interpreting corpus against a comparable corpus of non-interpreted speeches in the target language, one may use the parallel corpus to ascertain that features observed in the interpreting corpus are related to the source speeches and strategies used by interpreters to shift between two languages (Bernardini, 2007).

A parallel corpus includes source and target texts (Kenning, 2010), which are aligned so that users can locate expressions occurring in one language with corresponding expressions in the

other (Aston, 1999). Compared with comparable corpora, parallel corpora are more suitable for observing shifts taking place in translating and interpreting processes and strategies adopted by translators and interpreters (Bernardini, 2007). Kenny (2014), for instance, uses a parallel corpus to examine how novel collocations in German are translated into English in literary translation and identifies a trend of normalisation. By using parallel corpora and comparable corpora in conjunction, researchers can examine how differences between source language and target language influence the patterning of target texts.

When it comes to the present study, three corpora were used, including a parallel corpus of interpreted speeches and source speeches, a comparable corpus of L1 English spontaneous speeches, and a reference corpus sampled to represent the contemporary use of British and American English (see Fig. 3.1). The parallel corpus, namely a Corpus of Interpreted Speeches (CIS), includes English-interpreted speeches produced by Chinese-speaking trainee interpreters in Chinese-to-English consecutive interpreting, along with aligned Chinese source speeches. The comparable corpus, Corpus of Non-interpreted Speeches (CNS), contains spontaneous speeches delivered by L1 English speakers at TED conferences. By comparing interpreted speeches in CIS with CNS, the present study can identify collocation features that distinguish English-interpreted speeches from English spontaneous speeches.

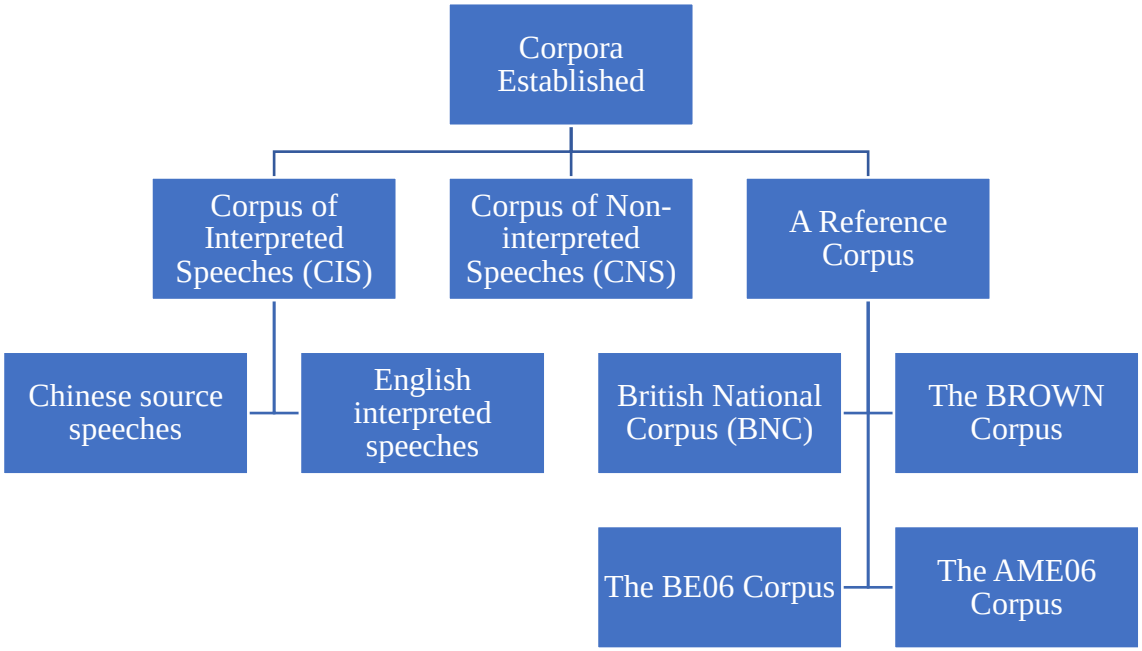



Figure 3.1: Corpora employed in the present study

The CIS is part of the Corpus of Interpreting for Pedagogical Purposes, compiled by researchers at Newcastle University. When the study was carried out, the CIS was only available to teachers and students at Newcastle University for pedagogical purposes. It consists of 33 Chinese source speeches and English-interpreted speeches produced by 79 trainee interpreters in the consecutive mode. The trainee interpreters are L1 Mandarin speakers and Advanced English learners with at least an IELTS band score of 7.0 for speaking and overall. They had completed a full academic year of training in interpreting theories and practice, with similar levels of interpreting competence. Therefore, trainee interpreters in this study are considered a homogeneous group in terms of their L2 proficiency and the interpreter training received in the UK. One limitation of the interpreting corpus is that other personal information of trainee interpreters[7], including age, length of time living in countries with English as the official language, educational background, and work experiences, were not accessible at the time of data collection. That makes it impossible for the present study to analyse the influence of individual differences on the use of collocations in interpreted speeches.

Source speeches and interpreted speeches in CIS were produced at five mock conferences held at a UK university from 2017 to 2020. Mock conferences were conducted in a simulated scene similar to international conferences. In interpreter training, mock conferences allow trainees to get involved in authentic interpreting tasks that may occur in future professional scenarios and to be prepared for future careers. At mock conferences, trainees need to dress appropriately, work with real conference speeches delivered by various speakers (native or non-native speakers, with or without accents) and face real audiences (Gile, 2002; Gillies, 2013). Speakers are only allowed to speak one language at mock conferences, which means that trainee interpreters need to play their roles as mediators to help achieve communication between speakers and target audiences. Therefore, mock conferences can be regarded as a connection between the interpreting classroom and real working situations, which serves as an ideal window for the present study to observe possible linguistic choices trainee interpreters might make in authentic conference interpreting. Based on the findings, the present study would be able to provide suggestions on future training accordingly.

[7] Data was collected in autumn 2020. All interpreters attending the mock conferences have already graduated before/in the summer of 2020.

Source speeches in CIS cover seven topics: architecture, entrepreneurship, film, game industry, law and justice, telecom, and travel. There are 33 speeches delivered by 33 different speakers. Among the 33 speeches, 7 are keynote speeches, each lasting around 45 minutes. Keynote speakers are experts from various industries, such as architecture, travel, and telecom. The other 26 are short speeches delivered at forum sessions, in which speakers exchange ideas about the same topic, such as games, film, and tourism development. Each short speech lasts from 6 minutes to 15 minutes. Speakers at the forum sessions are all stage-2 trainee interpreters in the interpreting programme. Before the conferences, speakers, who were classmates of trainee interpreters, collected background information about the forum topic and wrote the source speeches.

Regarding the difficulty and technicality of source speeches, which may influence the production of interpreted speeches, though some speakers were experts in particular areas, target audiences were not experts in those areas, so the speeches were not highly technical. At each mock conference, six trainee interpreters took turns to render one keynote speech, with each interpreter working for 7.5-8 minutes. For short speeches, 6-minute speeches were rendered by one trainee interpreter each, while 15-minute speeches were split by three interpreters, each working for around 5 minutes. Generally, each interpreter's interpreted speech lasts 5-8 minutes.

Before mock conferences, consent was obtained from trainee interpreters to record their interpreting performance and use the recording for research purposes. At mock conferences, trainees interpreted from Chinese into English consecutively, with the whole process of mock conferences being recorded in video. Before using the data, the researcher obtained permission from the university to use the data. Data of students who did not agree to have their output used for analysis were excluded from the corpus.

As for the comparable corpus CNS, the present study adopted the following criteria for the selection of L1 English speeches, which makes CNS comparable with the English part of CIS regarding topics, the number of speakers, and the degree of technicality,:

(1) The speeches are non-specialised and non-technical.

(2) English is either the only L1 of the speaker or the dominant language spoken by the

speaker[8].

(3) The topics of the spontaneous speeches are similar to those of the interpreted speeches.

(4) The number of L1 English speakers in CNS is the same as the number of interpreters in CIS.

Based on the four criteria, spontaneous speeches were selected from the website of TED[9]. As a conference devoted to spreading ideas, TED talks cover various topics in more than a hundred languages, from science to global issues. Speeches on the website are tagged with correspondent topics, making it easy for the researcher to identify spontaneous speeches that are of similar topics to interpreted speeches. Speakers' profiles are provided on the website, enabling the researcher to know the speakers' language background. Speeches tagged with architecture, entrepreneurship, film, game industry, law and justice, telecom, and travel were selected to be included in CNS. Moreover, the speeches selected are non-technical ones delivered by L1 English speakers, which are similar to the interpreted speeches. In total, 79 speeches delivered by 79 different speakers were composed into CNS, with each speech lasting for 10 to 15 minutes.

In addition to the parallel and comparable corpora, a reference corpus was used to extract natural and unnatural collocations from CIS and CNS and to analyse features of unnatural collocations in CIS. The reference corpus includes four sub-corpora: the British National Corpus (BNC), the Brown University Standard Corpus of Present-day American English (the BROWN Corpus), the BE06 Corpus, and the AME06 Corpus (P. Baker, 2009). The BNC Corpus consists of 100 million words of spoken and written British English between 1960 and 1993. The BROWN Corpus contains 1 million words of written texts in American English in 1961. Since both corpora may be outdated, the researcher included two more up-to-date corpora (i.e., the BE06 Corpus and AmE06 Corpus). The AmE06 Corpus is a million-word corpus of general written American English sampled in 2006, while the BE06 Corpus is a million-word corpus of general written British English sampled in 2006. The four sub-corpora together cover a wide range of genres, including spoken English, fiction, magazines, newspapers, academic English, web, and TV/movies, and have been used as reference corpora by previous research to help identify collocations from

[8] In line with Nesselhauf (2005), English is considered as the only L1 or the dominant language of the speaker if it had been both the predominant language of instruction in primary and secondary school where the speaker was educated and was the predominant language spoken in the country where the speaker grew up.

[9] For more information, see: https://www.ted.com/.

translated texts and L2 English (Kenny, 2001; Lu, 2016).

Compared with other L1 English corpora, the four reference corpora may be small and outdated. For instance, the Corpus of Contemporary American English (COCA)[10] has reached 1.9 billion words and has been updated annually since 1990. However, most large-scale contemporary corpora are run by online client query tools, which do not have the advanced functions (e.g. MI-score measures, T-score measures) the present study requires. Moreover, some corpora have query limitations. For instance, researchers are allowed to query the COCA up to two hundred times every twenty-four hours, which would slow down the speed of collocation extraction. Besides, large-scale corpora are run by separate client programmes and cannot be combined for queries. The four reference corpora used in the current research are the sub-corpora of the corpus of Intelligent Tools for Creating and Analysing Electronic Text Corpora for Humanities Research (IntelliText 2.6)[11]. IntelliText 2.6 is introduced in Subsection 3.3.

The general features of CIS, CNS and reference corpora are summarised as follows:

| Features | CIS | CNS | The Reference Corpus |
|---|---|---|---|
| **Language** | Source language: Chinese (L1) Target language: English (L2) | L1 English | L1 English |
| **Topics** | Architecture, entrepreneurship, film, game industry, law and justice, telecom, travel | Architecture, entrepreneurship, film, game industry, law and justice, telecom, travel | General issues |
| **Genre** | Spoken | Spoken | Spoken and Written |
| **Sample types** | Full texts | Full texts | Full texts and text extracts |

[10] See: https://www.english-corpora.org/coca/
[11] http://corpus.leeds.ac.uk/itweb/htdocs/Query.html#

| | | | |
|---|---|---|---|
| **Degree of technicality** | Non-technical | Non-technical | Non-technical |

Table 3.1: General features of the CIS, CNS and the reference corpus

The CIS and the CNS are comparable regarding the genre, the topics, the sample types, and the degree of technicality. By comparing the two corpora, one would know whether collocations are more or less frequent, diverse and complex in interpreted speeches than in English spontaneous speeches. Both CIS and CNS are not directly comparable to the reference corpus because the reference corpus only represents the general use of L1 English and helps examine whether the word combinations occurring in CIS and CNS are common English collocations. The statistical information (e.g. corpora size, the number of files included) will be introduced in Subsection 3.2.3. In the next Subsection (3.2.2), the compilation procedure of CIS and CNS is elaborated.

### 3.2.2 The Procedure of Corpora Compilation

***Transcribing English-interpreted speeches and Chinese source speeches***

To compile a corpus that can be queried with corpus analysis tools, one should transcribe the spoken data first. Transcription quality directly affects the reliability of the language data and the research questions that can be answered using the corpus (Gablasova et al., 2019; Gilquin & Granger, 2015). Before transcribing audio/video recordings, one needs to consider the amount of information to be captured (Breiteneder et al., 2006; Cameron, 2001), the transcription conventions to be adopted, and the consistency and accuracy of transcription (Gablasova et al., 2019).

Regarding the information to be captured, since the present study attempts to understand the use of collocations from a cognitive perspective (as reviewed in 2.5.3), disfluencies in interpreted speeches, which are indicators of cognitive overload in interpreting (Gumul, 2021; Plevoets & Defrancq, 2018), were transcribed to facilitate data analysis. Disfluencies in Chinese source speeches were not transcribed. Disfluencies transcribed in the present study include fillers, false starts, self-repairs, and unfinished sentences (as listed in Appendix A). In addition, having considered existing transcription conventions (Adolphs & Knight, 2010; Bernardini et al., 2018; Gablasova et al., 2019), the researcher mainly adopted an approach of orthographical transcription to transcribe English-interpreted speeches and Chinese source speeches. A complete

phonetic transcription (transcribing speeches by acoustic signal/pronunciation) was not applied because Chinese and English have standardised writing systems, and orthographical transcripts are more searchable in corpus query tools. In the present study, phonetic transcription was only used for transcribing disfluencies in interpreted speeches, such as mispronounced words (e.g. *touristers* for *tourists*) and filled pauses (e.g. *erm*, *er*).

When it comes to the transcription convention, the present study adapted the transcription guidelines provided by Gablasova et al. (2019) (see Appendix A). Figure 3.2 is an example of a transcript:


Figure 3.2: An example of a transcript

The use of transcription guidelines ensures the consistency of transcripts in this study. Figure 3.2 is an example of how fillers are transcribed, illustrating the role of transcription guidelines in the consistency of transcripts. As noted by Thompson (2005), fillers, a frequent marker of spoken language, are difficult to be distinguished from each other. The same expression may be transcribed by the same transcriber differently at different times (e.g. *mhm*, *hm*, and *mm* for a

same filled pause) (Gablasova et al., 2019). Without a guideline, researchers may find it difficult to recall all the expressions they used to represent fillers and extract them from the corpora. Therefore, using transcription guidelines, which specify that all fillers are transcribed into "a closed set of back-channelling expressions" (Gablasova et al., 2019, p. 136), such as "erm and er", researchers can transcribe all fillers consistently. When extracting fillers from corpora, they can also simply search for expressions specified in the transcription guideline. The present study adopted the same system for transcribing filled pauses as Gablasova et al. (2019, p. 136). As shown in Figure 3.2, filled pauses are transcribed into "erm" and "er" according to their phonetic features, which facilitates concordance in analysing the corpus. Other systematic decisions have been made regarding the transcription of self-repairs, numbers, names, and abbreviations, as are recorded in the transcription guidelines in Appendix A.

The transcription of English-interpreted speeches was first done with Outter.ai[12], a programme that automatically recognises and transcribes audio. The programme's automatic transcription was then cross-checked by the researcher to produce the first version of the transcripts in txt. format. The spelling of the words and the disfluencies transcribed by the software were checked by the researcher to ensure accuracy. Furthermore, all the names of people, places, and names of celebrities were reviewed to check whether they were kept anonymous. Around fifty hours were spent on transcribing and checking the data. Then the transcripts were stored for Part of Speech (PoS) Tagging. Regarding the transcription of Chinese source speeches, IFLYTEK[13], a transcribing software supporting the transcription of Mandarin Chinese, was used for automatic transcribing. Then, mistakes in transcripts were corrected manually and stored in .txt formats.

***Aligning Chinese source speeches with English interpreted speeches***

An essential step for a parallel corpus to be ready for analysis is to align source speeches with interpreted speeches. Speech transcripts can be aligned at the word, sentence, paragraph, or textual levels (Kenning, 2010; McEnery & Xiao, 2008). The finer the alignment, the more fine-grained searches the corpus supports and the more complex the aligning process becomes. Aligning source speeches with interpreted speeches text by text or paragraph by paragraph is the most straightforward approach because compared with sentences and words, boundaries between

[12] https://otter.ai/
[13] https://www.iflyrec.com/

texts and texts or paragraphs and paragraphs are more precise. However, such an approach does not support fine-grained searches, such as searches of clauses and words. Word-level alignment enables researchers to search for correspondences of smaller units, such as clauses and words. Nevertheless, it is time-consuming to correspond words in source texts with those in target texts. In Mandarin Chinese, it is not easy to set boundaries among words and align each word with English words in source speeches. Compared with the other three approaches to corpora alignment, sentence-level alignment is easy to handle because, in most languages, boundaries between sentences are marked by punctuation and are easily identified. Furthermore, corpora aligned at the sentence level support the search of various linguistic units from words to texts. So far, many existing parallel corpora are aligned at the sentence level (Chang, 2004; Frankenberg-Garcia, 2009).

For the above reasons, source speeches and interpreted speeches were aligned at the sentence level in this study. The alignment was first processed by automatic corpus alignment software, Paraconc (Barlow, 2002). When aligning source speeches with interpreted speeches, it was noticed that some sentences in source speeches are equivalent to more than one sentence in interpreted speeches, while some sentences in source speeches do not have any equivalents in interpreted speeches. Furthermore, some sentences in interpreted speeches could not find equivalents in source speeches. Paraconc could not identify this inequivalence. Therefore, automatically aligned transcripts were manually revised. When there was no one-to-one correspondence between sentences in source speeches and interpreted speeches, sentences in interpreted speeches were split or combined with adjacent sentences to match each orthographic sentence in source speeches. Thus, each sentence in source speeches had a correspondence in interpreted speeches, whether the correspondence is one sentence, more than one sentence, or a fragment sentence. Source-speech sentences that are left un-interpreted were aligned with blank. Target-speech sentences that do not have correspondences in source speeches are combined with adjacent alignment units preceding them. Therefore, relations between sentences in source speeches and interpreted speeches can be one-to-one, one-to-many, one-to-part or one-to-zero but cannot be many-to-one. Aligned source speeches and interpreted speeches were stored in .txt formats in two files and ready to be searched (Chang, 2004).

***Collecting L1 English speeches***

As discussed in subsection 3.2.1, the CNS transcripts were collected from the TED website. Before collecting the data, the researcher checked the TED Talks Usage Policy on the TED website[14] (see Appendix B). According to the usage policy, TED Talk scripts are owned by the TED Talk organisation and can be used for non-commercial purposes. The researcher collected scripts of all the speeches under the eight topics mentioned in Subsection 3.2.1 and then manually cross-checked the scripts. TED scripts were stored in txt. format for PoS Tagging.

***PoS tagging***

Since the present study sets out to retrieve collocations from the spoken corpora by syntactic structures of collocations, which will be introduced in Subsection 3.3.2, the corpora were tagged with PoS taggers automatically. In a tagged corpus, each word has a mark showing its part of speech. Below is an example of the tagged interpreting corpus (Brezina, Weill-Tessier, & McEnery, 2020):

*Example (1): I_PP didn't_VVD|RB prepare_VV much_RB for_IN the=_DT today's_NN|POS presentation._NN*

One can use corpus query tools to automatically retrieve collocational patterns (e.g. verb + noun collocations, adjective + noun collocations) from the corpora by tagging the corpora. In Example (1), *prepare* is tagged as the base form of a verb (VV), *much* an adverb (RB), and *for* a preposition (IN). *Prepare much for* can be retrieved from the corpus as a verb + adverb+ prep collocation. In the present study, PoS tagging makes the interpreting corpora ready to be queried.

PoS tagging can be fully automatic, fully manual, or automatic with manual checks. Fully manual PoS tagging is time-consuming and impractical, even for a small corpus. Fully automated tagging, by contrast, can be finished in a short time. However, the accuracy rate of automatic taggers, ranging from 97% to 98% (Manning, 2011), may not be acceptable for some projects. For spoken corpora, the performance of taggers may be worse. In Westpfahl and Schmidt's (2016, p. 1495) study, the accuracy rate of automatic PoS tagging for a corpus of spoken German conversation is only 81.61%. Because the taggers do not recognise the data's spoken features, such as hesitation

[14] https://www.ted.com/

markers, disruptions, and repetitions, when it comes to the tagging of L2-interpreted speeches, some of the unnatural morphosyntactic structures may not be identified by the taggers, which would also influence the results of tagging (Lanstyák & Heltai, 2012).

In the present study, the two comparable corpora (CIS and CNS) were firstly automatically tagged with the PoS tagger of #LancsBox 5.1.2 (see 3.3.1), the corpus query tool used in this study. The tagsets of #LancsBox 5.1.2 are listed in Appendix C. To check the accuracy rate of PoS tagging, the researcher randomly examined a piece of tagged speeches in CIS and CNS, respectively. The results show that the accuracy rate of PoS tagging is 94.74% for CIS and 95.63% for CNS (See Appendix D). Such accuracy rates might be under the influence of the spoken features of the two corpora. For instance, in *And=_CC* ***but_RB*** *I_PP think_VVP what_WP lies_VVZ under_IN the_DT texts_NNS is_VBZ…*, *but* as a conjunction in this context is tagged as an adverb, which might be caused by the occurrence of "and" in front of it. Though the accuracy rate is not as satisfactory as those obtained by Manning (2011), the accuracy rates of PoS tagging of the two corpora are similar. Therefore, it is believed that tagging errors evenly disperse in the two corpora and do not significantly affect the statistical findings yielded from comparing the two corpora.

### 3.2.3 Corpora Size

The CNS is almost three times the size of the CIS, which is an inevitable consequence of the sampling strategy used by the present study in compiling corpora (Table 3.2). Imbalances are a methodological difficulty inherent in building comparable corpora, and "what is being compared can never be totally balanced in every respect" (M. Baker, 2004, p. 171). Size imbalance applies particularly to corpora composed of full speeches. In the present study, the researcher decided to balance the number of L1 English speakers and the interpreters who provided data and include full speeches rather than speech extracts[15] when designing the corpora. Due to the varying length of the full speeches, the sizes of the two corpora are different.

| Corpus name | Number of files | Tokens |
|---|---|---|
| **CIS** | 79 | 52,077 |

[15] Collocations might be distributed unevenly throughout the texts (Baker, 1995; Sinclair, 1991; Kenny, 2001). Therefore, cutting speeches into shorter extracts to make CIS and CNS comparable in sizes may still influence the comparability of the two corpora.

| | | |
|---|---|---|
| **CNS** | 79 | 150,219 |
| **Total** | 158 | 202,296 |

Table 3.2: Sizes of CIS and CNS

Comparisons between corpora of different sizes have been reported in preceding corpus-based studies (Allan, 2016; Berglund, 2000; Reppen, 2009). For instance, Chen and P. Baker (2016) compare the use of four-word lexical bundles in three L2 English corpora ranging in size from 26,000 words to 88,000 words, a ratio of one to three. The researchers extract collocations by the frequencies they occur in each learner corpus rather than in a reference corpus. If a lexical combination occurs more than certain times in the self-built corpora, it would be regarded as a typical collocation. To eliminate the impact of size difference on the results, the researchers used a dynamic threshold for the frequency of occurrence. In the corpus of larger size, a lexical combination needs to recur more than four times to be regarded as a collocation; while for the corpus of smaller size, the cut-off point is three or more occurrences. However, since the present study relies on a reference corpus rather than the two comparable corpora, i.e., the CIS and the CSS, to identify collocations, the size imbalance would not have a significant influence on the results. To avoid drawing conclusions that could result from chance, the researcher used statistical tests to examine whether the results were significant, as shown in Chapter Four.

Another issue worth discussing is the appropriateness of corpus size, which is a factor influencing the representativeness of a corpus. So far, no consensus has been reached on the maximum or the minimum number of words a corpus should contain (Sinclair, 2004). Some researchers attempt to establish a standard for the minimum size of corpora. For instance, Biber (1993) and McEnery and Wilson (1997) suggest that the ideal size should be around a million. Friedbichler and Friedbichler (2000) note that a size between 500,000 and 5 million words is sufficient for a corpus to provide sample evidence in 97% of the queries. Some scholars suggest that "the bigger the corpus, the better" (Church & Mercer, 1993, p. 13-19; Wilkinson, 2005, p.6). Some researchers propose counterarguments, claiming that representativeness is only a matter of degree. Small corpora with "a few thousand and a hundred thousand words" (Bowker & Pearson, 2002, p.48) are also meaningful for studies in specific areas because the lexis used in specialised discourse (e.g. legal texts, medical texts) are more restricted than those used in non-specialised ones (see also Ghadessy & Gao, 2001; Wright & Budin, 1997). P. Baker (2006, p. 28-29) stresses quality and homogeneity over quantity when it comes to corpora built for a particular subject.

Some studies have been conducted based on small corpora. For instance, Ferraresi and Miličević (2017) use an interpreting corpus of 33,675 words to study collocational patterns in interpreted Italian. The limited size of the corpus may be due to the difficulty in accessing interpreted Italian. Even though the corpus size is not as large as those of one million words, data are from the same cohort: conferences of the European Parliament and can still shed light on interpreting carried out in similar contexts.

Compared with other L1 English corpora and interpreting corpora, such as the European Parliament Interpreting Corpus [16] (Monti et al. 2005), the CIS and the CNS may not be quantitatively representative. However, the CIS and the CNS are designed for the specific aim of this present study: to investigate linguistic features of trainees' interpreted speeches. In building the corpus, the researcher considered the homogeneity of the data and collected as many interpreted speeches as possible.

## 3.3 The extraction and analysis of collocations

### 3.3.1 Combining the frequency-based and structural approaches

As discussed in Section 2.2, three approaches, i.e., *the phraseological approach, the frequency approach,* and *the structural approach,* have been adopted by previous studies to operationalise the identification of collocations in texts and speeches. Studies falling within the *phraseological approach* differentiate collocations from *free lexical combinations* and *idioms* by evaluating the substitutability of components and the semantic opaqueness of a lexical combination (Cowie, 1998; Nesselhauf, 2005). In these studies, a word string is a collocation if a limited number of synonyms can substitute its components or if its meaning cannot be identified from the literal meaning of its components (Howarth, 1998; Nesselhauf, 2005). The phraseological school delimits the notion of *collocation* from *free combinations* and *idioms* and lays a theoretical underpinning for collocation extraction.

Steering away from the criteria of substitutability and semantic opaqueness, the frequency-based approach focuses instead on parameters needed for extracting collocations automatically from corpora (Bernardini, 2007). As defined by Kjellmer (1987, p.133), collocations are "sequences of words that occur more than once in the identical form". Studies adopting a frequency-based

[16] The EPIC consists of almost 180,000 tokens in total.

approach identify collocations by their frequency in a corpus (Bernardini, 2007). Furthermore, frequency-based studies use association measures such as t-score and mutual information (MI) scores to evaluate the strength of association among components of collocations (Durrant & Schmitt, 2009; Ferraresi & Miličević, 2017).

The present study combined the frequency-based approach and the structural approach to retrieve collocations from CIS and CNS and does not aim to distinguish collocations from idioms and free combinations. Collocations are broadly defined as "the relationship a lexical item has with items that appear with greater than random probability in its context" (Hoey, 1991, p. 7). Adopting a frequency-based approach, the present study extracted collocations by setting a threshold of occurrence frequency. If a lexical combination occurs for more than certain times in reference corpora, the lexical combination is regarded as a collocation.

The frequency-based approach instead of the phraseological approach was selected because within the phraseological approach, the degree of substitutability of components is determined by human judgements only and is hard to be evaluated computationally. Different researchers may make different decisions when identifying collocations. In comparison, frequency-based methods offer ways for researchers to set up a consistent cut-off point when measuring the frequency and strength of association of collocations, which ensures the comparability of research findings. Second, retrieving collocations using phraseological methods requires more manual work than the frequency-based approach, which is time-consuming and impractical for analysing large corpora. Researchers extracting collocations by evaluating the semantic opaqueness and substitutability of components subjectively may also overlook many combinations that do not meet the two criteria but recur frequently in a corpus. As is discussed by Durrant and Schmitt (2009, p. 159), combinations that occur frequently in a language are "key to the naturalness of native production", though not all those frequently occurring collocations meet the criteria of semantic opaqueness and restricted substitutability proposed by the phraseological approach. Focusing exclusively on "restricted or semantically anomalous collocations may overlook a large and important part of collocations" (ibid). In comparison, the frequency-based approach enables one to retrieve collocations quantitatively, presenting a complete picture of collocations produced by language users.

Despite its efficiency in collocation extraction, a pure frequency-based definition of collocation, as described above, is still hard to operationalise, as it does not specify how to select lexical combinations to be checked in reference corpora. Existing studies adopting a frequency-based approach operationalised the frequency-based approach with two methods: a "bottom-up" method (Dayter, 2020, p. 72) and the method of combining the frequency-based approach with the structural approach. Studies using a bottom-up method mainly explored the collocation pattern of words occurring frequently in the corpus under investigation (Bernardini, 2015). For instance, Kenny (2001) examined how unnatural word combinations consisting of the node *Auge* ("eye") are translated into English in literary translation. According to Kenny (ibid), the word *Auge* and its collocates were selected for analysis because *Auge* occurs frequently enough in the corpus to yield representative results. Kenny's methodology shows how a frequency-based approach can be used to extract collocations from a corpus. However, as was acknowledged by Kenny (2001, p. 210-211), the selection of collocations is relatively arbitrary, which may hinder the generalisation of findings. In addition, collocations extracted by this approach are restricted by the corpus size. For instance, extracting collocates of several specified words from a small corpus may not obtain many collocations.

To circumvent the methodological limitation of the bottom-up method, some scholars combined the structural approach with the frequency approach to extract collocations. The structural approach sees a collocation as an integration of grammatical and lexical relations among lexical items. Studies falling into the structural approach took both frequencies of occurrence and the syntactic structure of word combinations into consideration when determining whether a lexical combination is a collocation (Bernardini, 2007; Granger & Bestgen, 2014; Paquot, 2019). For instance, Bernardini (2007) extracted Adjective + Noun, Noun + Noun, Verb + Noun, Noun + preposition | conjunctive+ Noun, and Verb + pronoun + pronoun + Noun combinations from translated and original English and Italian texts and calculates the frequency and association strength of those combinations in BNC (100 million words) and the Repubblica Corpus for Italian (340 million words). Combinations occurring more than once in the reference corpora and with an MI>2 score were identified as collocations. Compared with the bottom-up approach, the structural approach is less subjective. It helps exclude the combination of lexical items that do not have grammatical relations but co-occur frequently by chance, such as "*but too*, *day but*, *night he*" (Men, 2015, p.19). Moreover, the structural approach, which involves examining the

grammatical relationships between words, enables the systematic extraction of a considerable number of collocations, even from small corpora. This is possible because it allows the examination of collocations that occur within various grammatical structures.

Based on the above understanding, the present study combines the structural and frequency-based approaches to extract collocations from CIS and CNS. Collocations are defined as grammatically restricted lexical combinations that recur frequently in languages. There are two reasons. First, this study is not based on large corpora. Retrieving collocations by their grammatical structure enables the researcher to identify as many collocations as possible from corpora. Second, as reviewed in Subsection 2.2.3, previous studies adopting the structural approach uncover that interpreters and L2 English learners use collocations with different grammatical structures in different manners (Hunston & Francis, 2000; Nelson, 2000; Nesselhauf, 2005; Men, 2015). For instance, Men (2017) reveals L2 English learners who have Chinese as the L1 make more errors when using V+N collocations than N+N and ADJ+N collocations. It seems that the use of collocations by L2 English users is related to the grammatical structure of collocations. Therefore, adopting the grammatical approach, the current study would also reveal if the use of collocations by trainee interpreters in interpreted speeches is restricted by the grammatical structure of collocations.

In the present study, English collocations were categorised into ten types by grammatical structures (Benson et al. 2010). Only lexical items that are directly adjacent to each other were considered to constitute collocations. Since previous studies have investigated verb+…+noun, verb+preposition, noun+noun, adjective+noun, adverb+adjective, verb+adverb and verb+noun collocations in L2 English (Men, 2015; Nesselhauf, 2005; Paquot, 2019), the present study also examined these seven types of collocations. By adopting such a categorisation, the present study can compare its findings with those yielded by L2 English acquisition studies and uncover if trainee interpreters produce collocations differently than L2 English users. In addition, based on *The BBI Combinatory Dictionary of English* (Benson et al. 2010), the present study added another three types of collocations into the classification of collocations, i.e., adjective+preposition, noun+preposition and preposition+noun collocations (Table 3.3).

| Types of collocations | Examples |
|---|---|

| | |
|---|---|
| verb +…+ noun (V+…+N) | *give a speech, make some money, motivate people* |
| noun+ noun (N+N) | *time management, wedding dress* |
| noun + verb (N+V) | *patients recover, earthquake destroys* |
| adjective + noun (ADJ+N) | *open space, new way* |
| adverb + adjective (ADV+ADJ) | *very important, quite interesting* |
| verb+ adverb (V+ADV) | *grow up, connect together* |
| verb + preposition (V+PREP) | *think about, come from* |
| adjective + preposition (ADJ+PREP) | *(be) different from, (be) familiar with* |
| noun+ preposition (N+PREP) | *(the) relationship between, (the) difference between* |
| preposition+ noun (PREP+N) | *after graduation, at night* |

Table 3.3: Types of collocations examined

It needs to be noted that the extraction of collocations was partially based on their grammatical structures. Collocations under consideration in this study incorporated words that consistently co-occurred with lexical combinations extracted by grammatical structures, ultimately forming semantically complete units. Without these words, the lexical combinations would be incomplete. To illustrate this, *line with* was extracted from the interpreting corpus as an N+PREP lexical combination. However, this expression, in isolation, does not convey a complete semantic understanding. Therefore, the preceding preposition *in* was incorporated into the lexical combination *line with*. Despite this addition, *in line with* continued to be classified as an N+PREP collocation in the current study. This method transcends rigid grammatical rules to capture semantically comprehensive lexical combinations.

Having identified the approach to defining and categorising collocations, the next subsection moves to how collocations were extracted from CIS and CNS.

### 3.3.2 The procedure of collocation extraction

The researcher first identified collocation candidates by their grammatical structures. Collocation

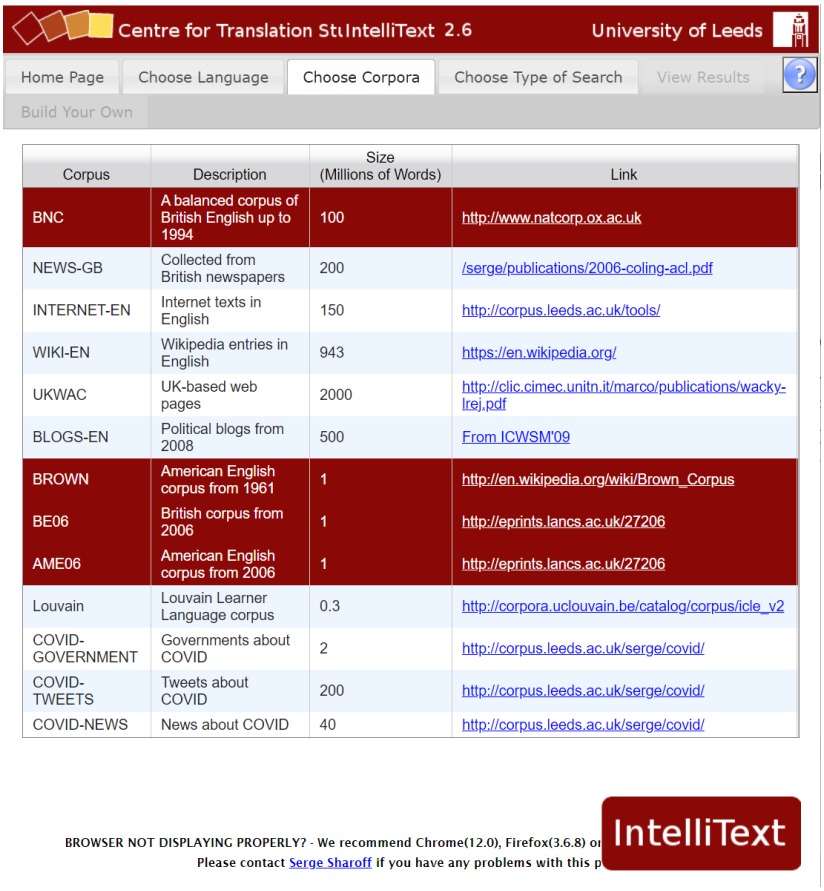
candidates are not collocations. Rather, these candidates represent grammatically sound lexical combinations that hold the potential for being collocations or unnatural collocations. Components of collocation candidates are directly adjacent to each other. As discussed in Subsection 3.2.2, CIS and CNS were subject to the process of Part of Speech tagging. This computational procedure helps label the individual words in a corpus according to their grammatical category.

The researcher performed the extraction of #LancsBox 5.1.2 (Brezina et al., 2020), a corpus analysis that allows automatic extraction of collocation candidates by grammatical structure. Developed by Lancaster University, #LancosBox 5.1.2 is software for corpora analysis and has been used to investigate the synchronic difference and diachronic change of L1 English collocations (Gablasova et al., 2017). It supports a range of approaches to observing collocations, such as the frequency of occurrence and exclusivity of the components of collocations. Furthermore, the software supports automatic PoS tagging and collocation concordance.

Collocation candidates were extracted with the KWIC tool of #LancsBox 5.1.2. As a concordance tool, KWIC allows the researcher to query collocations by grammatical structures. For example, one can generate a list of collocation candidates with the structure of verb + noun by inputting VERB NOUN in the search box or V* N* in the POS box of the KWIC tool (see Figure 3.3). Then the KWIC tool would display texts to the left and the right of the searched items, the frequency of the collocation candidates, and the files from which collocations are extracted. Due to some PoS tagging mistakes and the inclusion of disfluencies in transcripts, some collocation candidates automatically extracted with #LancsBox 5.1.2 may not be regarded as collocations (e.g. *er of* is identified as a noun + preposition combination because *er* as a filled pause is tagged as a noun). These collocation candidates were then manually sorted, with mistakes excluded.

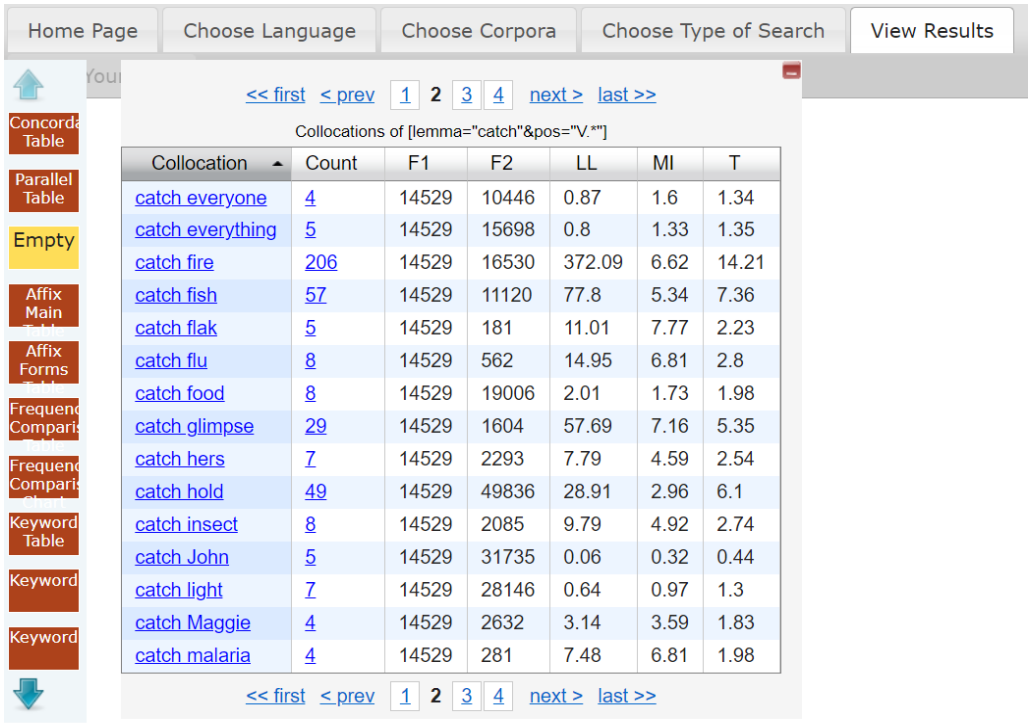

Figure 3.3: The KWIC Tool of #Lancsbox 5.1.2

Having extracted collocation candidates from CIS and CNS, this study checked all of them in the reference corpus with IntelliText 2.6, a client corpus analysis tool that support the combination of the BNC, the BROWN corpus, the BE06 Corpus, and the AmE06 Corpus (see Figure 3.5). As discussed in subsection 3.1.1, only one corpus query system was used for the sake of direct comparability and due to the access restrictions of large corpora such as COCA. IntelliText 2.6 was developed by the Centre of Translation Studies at the University of Leeds.




| Corpus | Description | Size (Millions of Words) | Link |
|---|---|---|---|
| BNC | A balanced corpus of British English up to 1994 | 100 | http://www.natcorp.ox.ac.uk |
| NEWS-GB | Collected from British newspapers | 200 | /serge/publications/2006-coling-acl.pdf |
| INTERNET-EN | Internet texts in English | 150 | http://corpus.leeds.ac.uk/tools/ |
| WIKI-EN | Wikipedia entries in English | 943 | https://en.wikipedia.org/ |
| UKWAC | UK-based web pages | 2000 | http://clic.cimec.unitn.it/marco/publications/wacky-lrej.pdf |
| BLOGS-EN | Political blogs from 2008 | 500 | From ICWSM'09 |
| BROWN | American English corpus from 1961 | 1 | http://en.wikipedia.org/wiki/Brown_Corpus |
| BE06 | British corpus from 2006 | 1 | http://eprints.lancs.ac.uk/27206 |
| AME06 | American English corpus from 2006 | 1 | http://eprints.lancs.ac.uk/27206 |
| Louvain | Louvain Learner Language corpus | 0.3 | http://corpora.uclouvain.be/catalog/corpus/icle_v2 |
| COVID-GOVERNMENT | Governments about COVID | 2 | http://corpus.leeds.ac.uk/serge/covid/ |
| COVID-TWEETS | Tweets about COVID | 200 | http://corpus.leeds.ac.uk/serge/covid/ |
| COVID-NEWS | News about COVID | 40 | http://corpus.leeds.ac.uk/serge/covid/ |

Figure 3.4: Corpora supported by IntelliText 2.6




| Collocation | Count | F1 | F2 | LL | MI | T |
|---|---|---|---|---|---|---|
| catch everyone | 4 | 14529 | 10446 | 0.87 | 1.6 | 1.34 |
| catch everything | 5 | 14529 | 15698 | 0.8 | 1.33 | 1.35 |
| catch fire | 206 | 14529 | 16530 | 372.09 | 6.62 | 14.21 |
| catch fish | 57 | 14529 | 11120 | 77.8 | 5.34 | 7.36 |
| catch flak | 5 | 14529 | 181 | 11.01 | 7.77 | 2.23 |
| catch flu | 8 | 14529 | 562 | 14.95 | 6.81 | 2.8 |
| catch food | 8 | 14529 | 19006 | 2.01 | 1.73 | 1.98 |
| catch glimpse | 29 | 14529 | 1604 | 57.69 | 7.16 | 5.35 |
| catch hers | 7 | 14529 | 2293 | 7.79 | 4.59 | 2.54 |
| catch hold | 49 | 14529 | 49836 | 28.91 | 2.96 | 6.1 |
| catch insect | 8 | 14529 | 2085 | 9.79 | 4.92 | 2.74 |
| catch John | 5 | 14529 | 31735 | 0.06 | 0.32 | 0.44 |
| catch light | 7 | 14529 | 28146 | 0.64 | 0.97 | 1.3 |
| catch Maggie | 4 | 14529 | 2632 | 3.14 | 3.59 | 1.83 |
| catch malaria | 4 | 14529 | 281 | 7.48 | 6.81 | 1.98 |



Figure 3.5: Words collocating with *Catch*

As shown in Figure 3.4, the researcher selected the four reference corpora. Figure 3.5 displays words that collocate with *catch*. The Count line, representing raw frequencies of collocations, shows that *catch fire* occurs 206 times in the reference corpora. Based on the raw frequency displayed by IntelliText 2.6, the researcher decided whether a collocation candidate is a natural collocation or not. Combinations occurring more than or equal to 5 times in reference corpora are natural collocations (hereafter collocations). Those occurring for less than 5 times in reference corpora are potentially unnatural collocations, which will be further searched in English dictionaries and evaluated by L1 English raters (Subsection 3.3.4). The frequency threshold was set at five because previous studies have adopted this threshold to extract usual and unnatural collocations from L2 English (Durrant and Schmitt, 2009; Granger and Bestgen, 2014). To ensure methodological comparability, the present study adopted the same threshold.

### 3.3.3 Comparing the frequency, diversity, and complexity of collocations in CIS and CNS

Having extracted all collocations from CIS and CNS, the present study compared raw frequencies of collocations in these two corpora. The raw frequency is a count of all occurrences of collocation in a corpus (Brezina, 2018). Since CNS includes more tokens than CIS, raw frequencies of collocations in the two corpora are not directly comparable. Therefore, the relative frequency of collocations per 10,000 words was compared to show how many collocations, on average, trainee interpreters and L1 English speakers produced every 10,000 words (Ferraresi and Miličević, 2017). Relative (or normalised) frequency was calculated as follows:

$$relative\ frequency = \frac{raw\ frequency}{number\ of\ tokens\ in\ corpus} \times the\ basis\ of\ normalisation$$

Relative frequencies will be reported with absolute frequencies in this study. The basis of normalisation can be set at per 1,000,000 tokens, per 10,000 tokens, or even per 1,000 tokens. The reason for setting the basis for normalisation at 10,000 is to make it easier for readers to know what the raw frequency could be. This will be further explained in Chapter Four, where results are presented.

To compare the diversity of collocations in CIS and CNS, this study uses the type/token ratio (TTR) to represent the diversity of collocations. In corpus linguistics, the type/token ratio is a statistical measure that reflects the lexical diversity of corpora (Brezina, 2018). Types are the number of different/unique words in a corpus, and tokens are the number of individual words.

TTR is defined as follows:

$$TTR = \frac{number\ of\ types\ in\ the\ corpus}{number\ of\ tokens\ in\ the\ corpus}$$

The larger the TTR, the more lexically diverse the corpus is. The same measure can also be applied to analysing the diversity of other lexical items, including collocations. The number of tokens represents the total number of collocations in a corpus. The number of types is the total number of unique collocations. A unique collocation is defined by considering all linguistic variations of a collocation as constituents of the same collocation type. Those linguistic variations manifest across various grammatical categories, such as number (singular or plural), tense (past, present), and the use of determiners. For instance, the collocations *bought a book*, *buy books*, *buy a book*, are all counted as one collocation type but three tokens of collocations.

While TTR is a good measure for lexical/collocational diversity, it may introduce bias when comparing corpora of different lengths. Given a group of language users that generate texts, previous literature shows that as the length of texts generated increases, while the lexical diversity of the texts remains the same, the TTR decreases (Covington & McFall, 2010; Tweedie & Baayen, 1998). This phenomenon can be attributed to the propensity for collocation repetition to increase with the extension of the text, suggesting a higher likelihood of subsequent collocations having previously occurred (Covington & McFall, 2010). Therefore, when comparing two texts of different lengths, the TTR may not provide an accurate representation of the lexical diversity of the two texts. Notably, it is probable for the shorter text to exhibit a larger TTR than the longer text. Given the limitation of the TTR as a measure of diversity, previous studies attempted to improve the TTR measure by introducing the standardised type/token ratio (STTR) measure (Scott, 2004). With this measure, previous studies (Scott, 2004) divided two corpora under comparison, each into standard-size, consecutive segments. Each segment includes the same size of tokens. The TTRs of each segment were then calculated independently. The STTR of a corpus is defined as the arithmetic mean of the TTRs of its segments. By normalising the sizes of corpora under comparison, STTR provides a more reliable measure of lexical diversity that is less sensitive to text lengths.

In the present study, CNS is around 3 times larger than CIS in size, thus, being not directly comparable with CIS regarding the TTR of collocations. STTR stabilises TTR by segmenting texts into sequential chunks and can be applied to comparing the diversity of collocations in two

corpora with different sizes. However, for the present study, speeches in the two corpora have no linear, sequential structure. Each speech has its topic, style, and language patterns, unique to the individual speaker and their context. Segmenting speeches into sequential chunks for the purpose of calculating the STTR of collocations may potentially yield inconsistent results. For example, if two speeches sharing similar topics are grouped into one segment, the TTR of collocations of this segment may be lowered. This is because the shared topic might lead to the more frequent occurrence of repeated collocations, which would inflate the number of collocation tokens relative to the number of collocation types, thereby reducing the TTR. Conversely, a segment composed of speeches with different topics is likely to have a greater diversity of collocations, leading to a higher TTR. Therefore, it is necessary to develop a new approach to make the TTR of collocations in CNS comparable with those in CIS. Such a method would need to control these individual speech characteristics, ensuring that the calculated TTRs are comparable across the two corpora.

Given the higher raw frequency of collocations in CNS than in CIS (a fact which will be further elucidated in Chapter Four), the present study needs to align the raw frequency of collocations in the CNS more comparable with that in the CIS, thereby enabling a valid comparison of TTR of collocations between the two corpora. Such an alignment of the raw frequency requires a representative sampling of collocations in CNS. The present study proposes a method of iterative, independent sampling conducted across multiple rounds (specifically, 100 rounds). The sampling round is set at 100 rounds because after the 100 rounds, collocations produced by all L1 speakers are covered. The same threshold of random sampling has been adopted by Malvern et al. (2004) and McCarthy and Jarvis (2007) in testing the lexical diversity of corpora. Within each sampling round, several L1 speakers were selected from the CNS via a random selection method without replacement. That means that once a speaker was selected in a particular round, they were removed from the pool of potential selections in the same round. This procedure mitigates the risk of over-representing any single speaker's collocational features within the final data set. In addition, this selection process was based on the principle of uniform distribution, meaning that each speaker within the CNS had an equal likelihood of being chosen in each round of sampling. This further ensured that the selection process was unbiased and that all L1 speakers had an equal opportunity to contribute to the sampled data regardless of their individual characteristics.

Each round of sampling was designed to mirror the number of collocations in CIS. In other words, the number of collocations produced by L1 speakers selected in each round was calibrated to approximate that of the collocations produced by interpreters. Given the inherent impracticality of achieving an exact match between the raw frequency of sampled collocations produced by L1 English speakers and collocations used by trainee interpreters, a discrepancy of up to 3% was stipulated for the number of sampled collocations in CNS.

After each round of sampling, the TTR of collocations produced by the selected speakers was calculated. When the 100 rounds of random sampling were complete, the mean value of TTRs of collocations derived from all sampled data was calculated, which was then designated as the representative TTR for all collocations in CNS. This method was designed to thoroughly explore collocations produced by all L1 English speakers in CNS, reducing the bias of the STTR measure. Since this method is based on random sampling, the average TTRs obtained are named the randomly sampled type/token ratio (RSTTR). Since the present study examines ten types of collocations, the RSTTRs of each type of collocation in CNS, which was calculated by mirroring the overall frequency of each type of collocation in CIS, were compared with the TTRs of each type of collocation in CIS.

Having analysed the diversity of collocations in the two corpora, the next step was evaluating and comparing the complexity. As reviewed in Subsection 2.2.2, MI-score and t-score have been used by many recent studies to evaluate the complexity of collocations in language output (e.g. Durrant & Schmitt, 2009; Granger & Bestgen, 2014; Ferraresi & Miličević, 2018; Dayter, 2020). In this study, the online corpus tool IntelliText 2.6 provides easy access to these association measures for the reference corpus. Another measure, the z-score, can assess collocation complexity in corpora but will not be used in this study. This is because in terms of the result of measurement, the z-score is similar to the MI score, as it highlights strongly associated collocations in a corpus (McEnery et al., 2006). However, as noted by Dunning (1994), this measure assumes that collocations are normally distributed in a corpus, which is not true for the reference corpus in the present study, and it can substantially overestimate the degree of association of components in collocations. Therefore, the present study only tested the t-score and MI-score of collocations extracted from CIS and CNS with the reference corpus.

The MI-score indicates the strength of association between words in a corpus. It quantifies the extent to which the occurrence of one word informs us about the occurrence of another. Testing the MI score of a collocation, one measures how much more often components of the collocation co-occur in a corpus than they are expected to co-occur. Here, the expected frequency of co-occurrence is calculated based on the assumption that the components of the collocation co-occur purely by chance, resulting from their individual probabilities of occurrence in the corpus. Within this assumption, the presence (or absence) of one word in a corpus does not make the presence of the other word any more or less likely.

The calculation of MI scores of collocations is illustrated in the following formula:

$$MI\left(w_{1,}\, w_2\right) = log_2 \frac{P(w_{1,}w_2)}{P(w_1) \times P(w_2)}$$

In this formula, $w_1$ and $w_2$ are the words forming a collocation. $Log_2$ is the logarithm to base 2. $P(w_{1,}w_2)$ represents the probability of $w_1$ and $w_2$ co-occurring in the corpus, calculated by dividing the frequency of the collocation $(w_{1,}w_2)$ by the total number of two-word lexical combinations in the corpus. $P(w_1)$ and $P(w_2)$ refer to the probability $w_1$ and $w_2$ occur in the corpus respectively, calculated by dividing the frequency of $w_1$ and $w_2$ by the total number of words in the corpus respectively. Obviously, a higher $P(w_{1,}w_2)$ than the $P(w_1) \times P(w_2)$ means $w_1$ and $w_2$ do not simply co-occur by chance in a corpus. Instead, they highly expect the co-occurrence of each other and form a strongly associated collocation, which has high MI scores. Conversely, if the two words occur together as often as expected by their individual frequencies in the corpus, they have weaker associations, which is indicated by lower MI scores. In this regard, high-MI collocations' components are less likely to be found apart in a corpus than collocations with low MI scores (Bestgen & Granger, 2014; Durrant & Schmitt, 2009). In light of Durrant and Schmitt (2009), who identify an MI-score of 7 as the cut-off point between strong and weak collocations, the present study marked collocations with MI-scores higher than or equal to 7 as strongly associated collocations.

In addition to MI tests, the present study measured t-scores of collocations in CIS and CNS. While the MI score tests the strength of association between components of a collocation, the t-score measures the confidence with which one can know for certain that there is a statistically significant association between components of a collocation. The following formula illustrates

the calculation of the t-score of the association of two words ($w_1$ and $w_2$) in a collocation:

$$t = \frac{O - E}{\sqrt{O}}$$

In this formula, O represents the frequency of the collocation in a corpus, namely observed frequency. E is the expected frequency of the collocation, under the assumption the presence (or absence) of $w_1$ or $w_2$ in the corpus does not make the presence of the other word any more or less likely. The expected frequency is calculated by multiplying the frequency of $w_1$ and $w_2$ and then dividing the multiplied frequency by the total number of words in the corpus. By subtracting the expected frequency of a collocation from the observed frequency of the collocation, and then dividing the result by the square root of the observed frequency, one can determine whether the difference between the observed frequency and expected frequency of a collocation differs significantly.

Previous studies show that high t-score emphasises collocations frequently occurring in a corpus (Durrant & Schmitt, 2009; Siyanova & Schmitt, 2008). High t-score collocations differ from collocations with high raw frequency in that "while all collocations identified by the t-score are frequent, not all frequent word combinations have a high t-score." (Gablasova et al., 2017, p.161). In the present study, measuring the t-score of collocations helps distinguish the most common collocations from collocations that are less common in reference corpora (the contemporary British and American English). Following Durrant and Schmitt (2009), the t-score threshold was set at 10. Collocations with a t-score higher than 10 were marked as common English collocations. The cut-off point was set at 10 because Durrant and Schmitt's (2009) study reveals that a cut-off point of 10 differentiates the use of collocations by L1 and L2 English speakers. Though it would be more rigorous for the present study to divide collocations into groups by t-scores and to compare the frequency of each group of collocations between the two corpora, setting the threshold at ten is a more efficient approach. Therefore, the present study only looked into collocations with t-scores of more than 10 when comparing common English collocations in CIS and CNS. Collocations with t-scores of at least 10 were named common collocations.

Upon determining the frequency of both common and strongly associated collocations in CIS and CNS, this study examined the ratio of these collocations relative to the total collocation count within each corpus. A corpus with a higher ratio of common collocations and/or a lower ratio of strongly associated collocations was considered less complex in its collocations. Conversely, a

corpus with a higher ratio of strongly associated collocations and/or a lower proportion of common collocations was deemed to have greater collocational complexity.

The present study adopted four measures to compare the frequency, diversity, and complexity of collocations in CIS and CNS. First, the standardised frequency of collocations was compared to uncover whether the frequency of collocations differs across the two corpora. Then, the diversity of collocations in the two corpora was compared with the RSTTR measure proposed by this study. The proportion of high-t-score collocations and high-MI-score collocations to all collocations was calculated to compare the complexity of collocations in CIS and CNS. Using the four measures, the present study will unveil whether trainee interpreters use collocations differently from L1 English speakers in Chinese to English consecutive interpreting in terms of frequency, complexity, and diversity. The following subsection will discuss methods adopted to answer the second research question.

### 3.3.4 Analysing unnatural collocations in CIS

Apart from natural collocations, this study is interested in features of lexical combinations that do not conform to the norm of L1 English in CIS (RQ2), namely, unnatural collocations. To identify unnatural collocations, this study uses British and American English, two major varieties of L1 English to represent the conventional use of English. The question arises whether British and American English can represent the standard use of L1 English, as English has been used internationally by people with diverse L1 backgrounds (Jenkins, 2007). For many of these people, reaching the proficiency level of L1 English speakers is not the goal of learning English. Having identified these issues, some scholars suggest that common features of all varieties of English should be the norm in evaluating the quality of L2 English (Quirk, 1990).

Nevertheless, these suggestions do not directly apply to English learners who aim to reach an advanced level of English competence, particularly Chinese-speaking interpreters who work in L2 English. This is primarily due to the specific linguistic requirements of interpreting as a profession. Given the need for interpreted speeches to be accepted and understood by target audiences, conference interpreters are required to render the target language naturally, as stipulated by the International Association of Conference Interpreters (AIIC, 2016). This requirement implies that interpreters are expected to produce interpreted speeches close to the

conventions of the target language. In this context, the two recognised English language standards, i.e., British and American English, can represent the conventions of English. Therefore, in line with SLA acquisition (Men, 2015; Nesselhauf, 2005), the present study uses British and American English corpora as references to identify unnatural collocations in interpreted speeches.

As noted in subsection 3.3.2, lexical combinations were extracted from CIS by grammatical structures first. The researcher then searched all lexical combinations in the reference corpus. Those occurring fewer than 5 times, not including 5 times, in the reference corpus were considered less likely to be used in standard English and, therefore, grouped as potentially unnatural collocations (Nesselhauf, 2005). Among these potentially unnatural collocations, some were acceptable in L1 English (e.g. *a great project*, *green land*). To further filter out acceptable lexical combinations, the researcher searched all potentially unnatural collocations in three dictionaries of British and American English, namely, the Oxford Collocation Dictionary for Students of English (OCDSE), the BBI Combinatory Dictionary of English (BBI) (Benson et al., 2010), the Collins COBUILD English Dictionary (CCED). These dictionaries are complementary to the reference corpus in evaluating the naturalness of L2 English collocations and have been used in second language acquisition studies (Chang, 2018; Nesselhauf, 2005). Lexical combinations that were in the English dictionaries were excluded from potentially unnatural collocations.

Having sorted out potentially unnatural collocations that occurred fewer than 5 times in the reference corpus and were not in dictionaries, this study recruited two L1 speakers of British English and two L1 speakers of American English to select unnatural collocations from potentially unnatural collocations, in case some of the potentially unnatural collocations were contextually appropriate and understandable to the target audience (Nesselhauf, 2005). Potentially unnatural collocations were presented to raters with sentences in which they occur. Sentences before and after the collocation were also included to clarify the context of the occurrence of each collocation to raters. To ensure that the potentially unnatural collocation in question would be rated rather than other parts of the sentence, the researcher highlighted potentially unnatural collocations in each sentence. If more than two collocations occurred in the same sentence, all of them were highlighted.

When rating the naturalness of collocations, L1 speakers may find some collocations neither entirely acceptable nor unacceptable and may not reach a consensus in determining the acceptability of collocations (Chang, 2018; Nesselhauf, 2005). Though British and American English were selected as the norm, collocations could be highly variable between these two varieties of English among different L1 speakers or even individual L1 speakers of English (Nesselhauf, 2005). Therefore, it is impossible to simply categorise potentially unnatural collocations into natural and unnatural ones. Given the difficulty in rating collocations, the acceptability of potentially unnatural collocations was measured by degree in the present study. Candidates of unnatural collocations were rated first on a three-point scale, i.e., natural, unnatural, or unsure (Chang, 2018; Nesselhauf, 2005). For collocations rated as unnatural or unsure, the rater was asked to provide a more appropriate collocation to express the possible meaning interpreters intended to express based on the context in which those collocations occur. Yet, it must be emphasised that the determination of the interpreters' intended meaning may not invariably be achieved with absolute certainty in every case. Assessments of four raters were integrated into a final evaluation. All possible final assessments are shown in Table 3.4.

| Assessment 1 | Assessment 2 | Assessment 3 | Assessment 4 | The ultimate judgement |
|---|---|---|---|---|
| Natural | Natural | Natural | Natural | Natural |
| Natural | Natural | Natural | Unsure | Natural |
| Natural | Natural | Natural | Unnatural | Natural |
| Natural | Natural | Unsure | Unsure | Natural |
| Natural | Natural | Unnatural | Unsure | Natural |
| Natural | Natural | Unnatural | Unnatural | Unsure |
| Natural | Unsure | Unsure | Unnatural | Unsure |
| Natural | Unsure | Unsure | Unsure | Unsure |
| Unsure | Unsure | Unsure | Unsure | Unsure |
| Unsure | Unsure | Unsure | Unnatural | Unsure |
| Unsure | Unnatural | Unnatural | Natural | Unnatural |
| Unnatural | Unnatural | Unnatural | Natural | Unnatural |
| Unsure | Unsure | Unnatural | Unnatural | Unnatural |
| Unsure | Unnatural | Unnatural | Unnatural | Unnatural |

| | | | | |
|---|---|---|---|---|
| Unnatural | Unnatural | Unnatural | Unnatural | Unnatural |

Table 3.4: The acceptability assessment of collocations (Nesselhauf, 2005, p.52)

Having identified all unnatural collocations, we searched the English dictionaries (i.e., OCDSE, BBI, and CCED) for conventional expressions that can convey the intended meaning of unnatural collocations in CIS, based on the context of the source and target speeches. The differences between unnatural collocations and the conventional expressions in dictionaries and raters' suggestions were then analysed, which will be referred to as deviations hereinafter. For each type of collocation, the deviation rate was calculated as the proportion of the number of unnatural collocations out of the total number of collocations of that type. Based on thematic analysis of the deviations, the present study then generated features of unnatural collocations.

### 3.4 Identifying congruent collocations and interpreting shifts in CIS

To understand possible factors that lead to typical collocation features of interpreted speeches in CIS (RQ3), the researcher translated all natural and unnatural collocations in interpreted speeches word for word into Chinese. Those having natural word-for-word Chinese translations that convey the intended meaning of the interpreter are defined as congruent collocations. As reviewed in Subsection 2.3.2, the frequent occurrence of congruent collocations in L2 English indicates the possible influence of English learners' L1 mental lexicon on their acquisition and production of L2 collocations: learners mapped L1 expressions into their L2. Compared with English learners in SLA studies, interpreters in this study may be influenced not only by expressions in their Chinese mental lexicon, but also those in source speeches. Therefore, congruent collocations in this study indicate the possible influence of Chinese expressions in interpreters' mental lexicon and in source speeches. The researcher calculated the proportion of congruent collocations to all collocations (natural and unnatural) in interpreted speeches, which indicates the extent to which collocations in target speeches were influenced by the source language. To further identify the influence of interpreters' mental lexicon, the researcher identified congruent collocations that do not have correspondences in source speeches, which indicates the specific influence of interpreters' mental lexicon. The proportion of these source language mental lexicon related congruent collocations to all congruent collocations in interpreted speeches was also calculated.

In addition to congruent collocations, the present study also examined interpreting shifts, which

reflect how collocations in English interpreted speeches were rendered from expressions in Chinese source speeches. The notion of "interpreting shifts" derives from the term "translation shifts" proposed in translation studies (Catford, 1965, p.73; Munday, 2001, p.55). One of the earliest discussions about translation shifts is from Catford (1965, p.73), who defines translation shifts as "departures from formal correspondence in the process of going from the source language to the target language". Formal correspondence refers to matching surface structures of expressions in the source and the target language. To illustrate this, for instance, if a sentence in the source text can be translated word-for-word into a target language sentence with the same grammatical structure and meaning, the two sentences formally correspond to each other. In Catford's (1965) view, translation shifts are manifested by discrepancies in the surface structures of expressions in source and target texts. For instance, a translation shift occurs when a single lexis in the source text is translated into a full sentence in the target text.

Catford's account of translation shifts focuses on the formal changes that may occur in the translation process and the possible manifestations of such changes in target texts. However, such an account does not cover all possible changes that might take place in the translation process, such as the change in the meaning. In addition, Catford sees translation shifts as a technique translators make when addressing the difference between two linguistic systems. That implies when a literal, word-for-word translation of an expression from the source text fails to convey the intended meaning accurately or lacks natural fluency in the target language, translators are obliged to engage in shifts to bridge the linguistic disparities between the source and target languages. Such a definition of translation shifts is to some extent prescriptive, as it speculates that translators inevitably make those formal shifts when addressing the difference between source and target language.

While useful in its specific context, Catford's definition of translation shifts does not directly apply to the present study. This is primarily because the emphasis here is not on inevitable shifts due to the linguistic difference between Chinese and English. Rather, this study focuses on how collocations in target speeches were interpreted from the corresponding source speeches during the actual interpreting process. Therefore, this study defines interpreting shifts in a broader sense and uses it to the similarities and differences between the translated word-for-word Chinese translations of collocations in interpreted speeches and the source speeches as interpreting shifts.

Interpreting shifts were then categorised thematically based on their syntactic and semantic features. Interpreting shifts in this study do not have to be deviations of target speeches from source speeches (in Catford's sense) but can also be formal correspondences between the source and the target speech. That means the word-for-word, or literal, interpretation of a source speech expression into the target language is also regarded as a form of interpreting shift in this study.

Analysing features of interpreting shifts, the present study identified the possible influence of source speeches and interpreters' working memory capacity on their use of collocations. The researcher searched for Chinese source speeches of all English collocations in the parallel corpus and compared the Chinese translations with Chinese source speeches. Semantic and/or syntactic similarities and differences between the translated Chinese texts and the source speeches were named interpreting shifts. Interpreting shifts were then categorised thematically based on their syntactic and semantic features.

To ensure precision, the analysis procedure was implemented three times, upon which the researcher consolidated the outcomes of congruent collocations and interpreting shifts. Despite concerted efforts to minimise the subjectivity inherent in the analysis process, it is essential to acknowledge that the identification of congruent collocations and shifts is still based on the understanding of the researcher, which inevitably introduces subjectivity.

## 3.5 Summary

This chapter describes the design of this corpus-based investigation of collocations in interpreted speeches produced by Chinese-speaking trainees in Chinese-to-English consecutive interpreting. In addressing the three research questions, this study employed three corpora: a parallel corpus of English-interpreted speeches by 79 trainee interpreters at mock conferences held at a UK university from 2017 to 2020 and their Chinese source speeches; a comparable corpus of non-interpreted English speeches delivered by 79 L1 English speakers at TED conferences; and a reference corpus including contemporary large-scale British and American English corpora.

Based on the frequency-based and structural approaches to collocations in previous studies, this study extracted ten types of collocations from CIS and CNS. Then, to find out the collocational features of interpreted speeches, collocations in CIS were compared with those in CNS with

respect to the standardised frequency of collocations, the RSTTR of collocations, and the proportion of high-t-score and high-MI-score collocations. This was to reveal whether collocations differ between interpreted and non-interpreted speeches regarding frequency, diversity, and complexity. To understand features of unnatural collocations in interpreted speeches, collocations from CIS, which occurred fewer than five times in the reference corpus, were rated by two American and two British English speakers on their naturalness. Based on the ultimate rating of four raters, the researcher identified unnatural collocations in the interpreting corpus for further analysis. To investigate possible reasons for typical collocational features of interpreted speeches, the researcher examined congruent collocations and retrieved source speeches of collocations to identify interpreting shifts. Having elucidated the methods adopted by this study, the next chapter presents findings of typical collocation features of interpreted speeches under investigation. Detailed analyses will be provided about the frequency, diversity, and complexity of collocations in CIS and CNS and the characteristics of unnatural collocations in CIS.

# Chapter Four. Collocation Features of Interpreted Speeches

Based on the methodology described in Chapter Three, this chapter presents the results of corpus analysis. Section 4.1 focuses on the difference between the frequency of collocations in the interpreting corpus and the corpus of L1 English speeches. Section 4.2 reports the difference between the two corpora regarding the diversity of collocations, as indicated by comparing the TTR of collocations in CIS with the RSTTR of collocations in CNS. Section 4.3 compares the proportion of common collocations and strongly associated collocations in the two corpora, which indicates the complexity of collocations. Section 4.4 addresses features of unnatural collocations in the interpreting corpus. Deviations concerning the use of components of unnatural collocations are categorised and analysed. Section 4.5 summarises this chapter.

## 4.1 Collocation frequency

### 4.1.1 Overall comparison

Following the methodology outlined in Subsection 3.3.2, this study retrieved a total of 2688 and 8617 collocations from CIS and CNS. Since the two corpora differ in size, the raw frequency of collocations needs to be normalised to be compared across the two corpora. In this study, the basis for normalisation was set at 10,000 tokens, which would not mask the raw frequency of collocations in the two corpora and lead to misunderstandings. For instance, if the basis for normalisation were set at 100,000 tokens, the normalised frequency of collocations in the interpreting corpus would become 5161.59, which far outnumbers the raw frequency. Though the normalised frequency is mathematically correct, it may mislead readers. Similarly, if the basis for normalisation were set at 1000 in this study, the normalised frequency of collocations in the interpreting corpus would become 55, which deviates from the raw frequency to a large degree. Therefore, this study set the basis for normalisation at 10,000 tokens.

Setting the basis for normalisation at 10,000, this study obtained the normalised frequency of collocations in CIS and CNS: 516.16 and 573.63 (Table 4.1).

| | Raw frequency | Normalised frequency | *p*-value | r value |
|---|---|---|---|---|
| CIS | 2688 | 516.16 | | |

| | | | | |
|---|---|---|---|---|
| CNS | 8617 | 573.63 | *p*<.001 | r=0.815 |

Table 4.1 The overall frequency of collocations in CIS and CNS

A comparison of the normalised frequency of collocations in CIS and CNS shows that, generally, interpreted speeches include fewer collocations than L1 English speeches. This difference is statistically significant, as indicated by the *p*-value calculated by the Mann-Whitney U (Wilcoxson rank-sum) test[17]: p<.001, r=0.815. The *r* value indicates a large difference between the raw frequency of collocations in CIS and CNS. The difference between CIS and CNS in overall collocation frequency aligns with the typical collocation features of L2 English discovered by previous studies, specifically the less frequent use of collocations than L1 English (e.g. Granger, 1998a; Laufer and Waldman, 2011; Howarth, 1996; Nesselhauf, 2005). This result indicates that interpreters tend to use collocations to a lesser extent than L1 English speakers, which makes their interpreting output less collocationally conventional than L1 English spontaneous speeches.

### 4.1.2 The frequency of the ten types of collocations

After finding out the overall frequency, the frequency of each of the ten types of collocations is then compared in CIS and CNS (Table 4.2, Figure 4.1). Though generally, interpreted speeches include fewer collocations than L1 English speeches, mixed results emerged when collocations were categorised by grammatical structures and compared across the two corpora.

| | Raw frequency | | Normalised frequency per 10,000 tokens | |
|---|---|---|---|---|
| Types of collocations | CNS | CIS | CNS | CIS |
| A+N | 2345 | 717 | 156.11 | 137.68*** |
| N+V | 284 | 55 | 18.91 | 10.56*** |
| V+ADV | 470 | 73 | 31.29 | 14.02*** |

[17] This study conducted a non-parametric Mann-Whitney test, which is suitable for comparing two groups of language data that are not normally distributed (Rasinger, 2013). In the present study, the p-value should be below 0.05 level to reject the null hypothesis that there is no difference between CIS and CNS. In addition to the p value, the Mann-Whitney test calculates the effect size, i.e., the size of difference between the two corpora, with r. In the present study, the cut-off points of the effect size are as follows (Brezina, 2018, p.191): Cut-off points of r: r > 0.1: a small effect; r > 0.3 a medium effect; r > 0.5 a large effect.

| | | | | |
|---|---|---|---|---|
| V+…+N | 952 | 266 | 63.37 | 51.08*** |
| V+PREP | 2248 | 621 | 149.65 | 119.25*** |
| **ADJ+PREP** | 238 | 94 | 15.84 | 18.05*** |
| **ADV+ADJ** | 549 | 248 | 36.55 | 47.62*** |
| **N+N** | 746 | 279 | 49.66 | 53.57*** |
| **N+PREP** | 496 | 205 | 33.02 | 39.36*** |
| **PREP+N** | 289 | 130 | 19.24 | 24.96*** |

*Note: Statistical significance levels: *** p <.001 ** p <.01 * p < .05.*

Table 4.2 Significant differences in the frequency of collocations in CIS and CNS

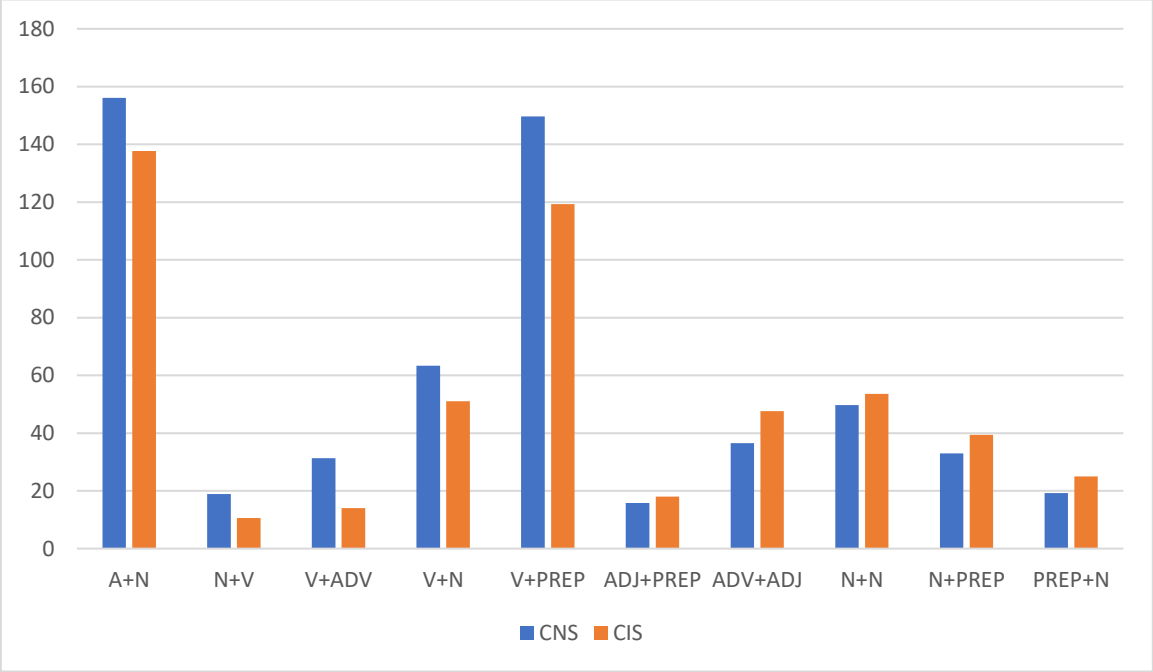



Figure 4.1 Significant differences in the frequency of collocations in CIS and CNS

In Table 4.2, the raw frequency and normalised frequency of the ten types of collocations are listed. The asterisks show whether the difference between CIS and CNS is statistically significant. The bar chart in Figure 4.1 provides a more straightforward representation of the difference between the raw frequency of the ten types of collocations in CIS and CNS. As depicted in Table 4.2 and Figure 4.1, five types of collocations (collocations with bold font), specifically A+N, N+V, V+ADV, V+…+N, and V+PREP, occur less frequently in interpreted speeches than in L1 English speeches. In contrast, ADJ+PREP, ADV+ADJ, N+N, N+PREP, and PREP+N are more prevalent in the interpreting corpus than the non-interpreting corpus. These findings suggest a

nuanced pattern of how trainee interpreters use collocations: while they tend to produce certain types of collocations with greater frequency than L1 English speakers do, they are less inclined to use other types of collocations as abundantly.

The features of collocations in interpreted speeches show resemblances to those typically demonstrated by L2 English users. For instance, similar to L2 English speakers in previous studies (Laufer & Waldman, 2011), trainee interpreters produce V+N collocations less frequently than L1 English speakers (Laufer & Waldman, 2011; Howarth, 1998). In addition to V+N collocations, the more frequent occurrence of N+N, PREP+N, and ADJ+PREP collocations in interpreted speeches corroborates Lu's (2016) findings that EFL learners produce N+N, PREP+N, and ADJ+PREP collocations more frequently than L1 English speakers do. Despite their advanced training compared with the EFL learners in Lu's study (2016), when working in L2 English, Chinese-speaking trainee interpreters still carry L2 English traits in their use of collocations.

Apart from the above-mentioned four types of collocations, interpreted speeches show features that are different to what has been observed in L2 English produced by Chinese-speaking EFL learners. Trainee interpreters use ADV+ADJ and N+PREP collocations more frequently than L1 English speakers. However, in Lu's (2016) study, Chinese EFL learners produced ADV+ADJ and N+PREP collocations less frequently than L1 English users in writing. Such a difference may be relevant to the different English proficiency of trainee interpreters and Chinese EFL learners. In Lu's research (ibid), EFL learners were non-English major undergraduate and graduate students in mainland China who can be regarded as intermediate English learners. But in the present study, as noted in Chapter Three, trainee interpreters are all advanced English users who have studied in the UK for at least one year. Therefore, it is likely that trainee interpreters know more ADV+ADJ and N+PREP collocations than EFL learners, thus, producing these two types of collocations more frequently than L1 English users.

Despite the above explanations based on comparisons with previous studies, it remains unknown why trainee interpreters overproduce certain types of collocations but underproduce others. In

explaining the more frequent production of N+N, PREP+N and ADJ+PREP collocations by Chinese EFL learners, Lu (2016) suggested that though Chinese English learners used these three types of collocations more frequently than L1 English writers, their use of collocation is more repetitive, which may have contributed to such a collocation overuse. To find out whether this is the case in the present study, the researcher compared the diversity of collocations in CIS and CNS, as will be presented in the next section.

## 4.2 Collocation diversity

### 4.2.1 Overall comparison

As outlined in Subsection 3.3.3, the diversity of collocations in CIS was measured by TTR and that in CNS was measured by the RSTTR. Then, the TTR of CIS and the RSTTR of CNS were compared. The results are displayed in Table 4.3:

| | TTR/RSTTR | *p*-value |
|---|---|---|
| CIS | 58.06% | |
| CNS | 64.26% | $p<.01$ |

Table 4.3 The overall diversity of collocations in CIS and CNS

Table 4.3 shows that the TTR of collocations in CIS (58.06%) is lower than the RSTTR of collocations CNS (64.26%) ($\chi^2$ (1)=7.9, p< .01)[18]. As noted in Subsection 3.3.3, a higher TTR/RSTTR value signifies a more diverse occurrence of collocations in a corpus. Since the RSTTR of collocations in CNS exceeds the TTR of collocations in CIS, the former corpus includes a greater variety of collocations than the latter. Therefore, trainee interpreters generally produced a narrower range of collocations than L1 English speakers.

Unlike L2 English learners in other studies (e.g. Tsai, 2015; Lu, 2016), trainee interpreters in the present study employed a limited range of collocations in interpreted speeches and repetitively produced a few collocations. Frequently recurring collocations include *see from*, *look like*, *talk*

[18] The statistical significance of the difference in collocation diversity across the two corpora was calculated with Log Likelihood tests (Rayson et al., 2004; Sprent, 2011). The *p-value* needs to be below 0.05 for the differences to be statistically significant.

*about, locate in, focus on, look at, come from, science park, very good, most important, so many, (a) place for, year after, (the) problem with, think about, for Example, in terms of, in order, (be) familiar with, (be) interested in, (be) different from*. These recurrent collocations are all very common in L1 English, and the use of these collocations may facilitate fluent production of the interpreted speech. It seems that like English learners in SLA studies, trainee interpreters also tend to repeatedly use a narrow set of collocations (Tsai, 2015) as their "collocation teddy bears", i.e., collocations that they are more familiar with and feel safer to use (Nesselhauf, 2005, p. 69). Though using these collocations helps interpreters produce fluent and natural interpreted speeches, the repeated use may add a rigid flavour to interpreted speeches.

### 4.2.2 The diversity of the ten types of collocations

Though generally, collocations in CIS are less diverse than those in CNS, different results emerge when the ten types of collocations in the two corpora were compared. As shown in Table 4.4, the TTRs of V+PREP, ADJ+PREP, PREP+N, N+PREP, N+N, and N+V collocations in CIS are smaller than RSTTRs of those six types of collocations in CNS, which means that interpreters produced those six types of collocations less diversely than L1 English speakers. As for A+N, ADV+ADJ, V+…+N, and V+ADV collocations, trainee interpreters used them in a more diverse manner than L1 English speakers, as indicated by the larger TTRs of those four types of collocations in CIS. However, statistically significant differences are observed in the diversity of two types of collocations: N+N and N+PREP collocations only: trainee interpreters produced these two types of collocations less diversely than L1 English speakers. No significant difference was identified between the two corpora when it comes to the diversity of the other eight types of collocations.

| | CIS (TTR) | CNS (RSTTR) |
|---|---|---|
| V+PREP | 0.4589 | 0.4919 |
| ADJ+PREP | 0.4255 | 0.4986 |
| PREP+N | 0.4076 | 0.4836 |
| N+PREP | 0.4243** | 0.6875 |
| N+N | 0.5017*** | 0.6871 |
| N+V | 0.8890 | 0.9090 |

| | | |
|---|---|---|
| A+N | 0.7197 | 0.7108 |
| ADV+ADJ | 0.6411 | 0.6073 |
| V+…+N | 0.8571 | 0.7754 |
| V+ADV | 0.7671 | 0.5952 |

*Note: Statistical significance levels: ***: p < 0.001 **: p < 0.01 *: p < 0.05.*

Table 4.4 The TTRs of collocations in CIS and RSTTRs of collocations in CNS

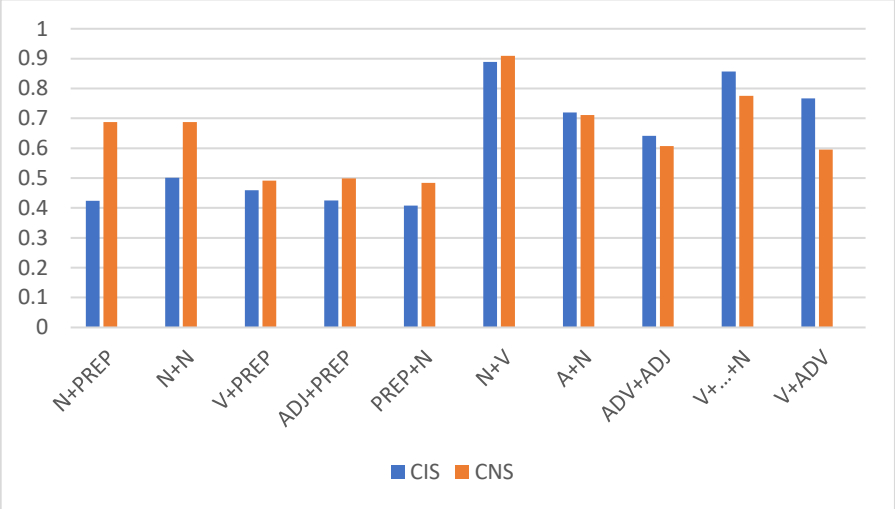



Figure 4.2 The TTRs of collocations in CIS and RSTTRs of collocations in CNS

As shown in Table 4.4 and Figure 4.2, interpreted speeches include a significantly narrower range of N+PREP and N+N collocations than L1 English speeches, indicated by the lower TTRs of those two types of collocations. As revealed in Subsection 4.1.2, N+PREP and N+N collocations occur more frequently in CIS than CNS. Given these, the more repeated occurrence of N+PREP and N+N collocations in CIS imply that though trainee interpreters can produce many N+N and N+PREP collocations, their production is restricted to a limited range. This result resembles the feature of L2 English discovered in previous studies (e.g. Lu, 2016).

This study further identified top ten most frequently recurring N+N and N+PREP collocations in CIS and CNS with the Ngrams function of LancsBox, the corpus analysis tool (Table 4.5 and Table 4.6).

| CIS | Raw | Normalised | CNS | Raw | Normalised |
|---|---|---|---|---|---|

| | frequency | frequency | | frequency | frequency |
|---|---|---|---|---|---|
| Science park | 21 | 4.032 | Science fiction | 11 | 0.732 |
| Game player | 6 | 1.152 | Suspension bridge | 10 | 0.666 |
| Project manager | 6 | 1.152 | climate change | 9 | 0.599 |
| Pipe organ | 6 | 1.152 | computer game | 9 | 0.599 |
| Product manager | 5 | 0.960 | cell phone | 8 | 0.533 |
| Cell phone | 5 | 0.960 | grocery store | 8 | 0.533 |
| Cancer patient | 5 | 0.960 | video game | 8 | 0.533 |
| Lung cancer | 4 | 0.768 | venture capital | 7 | 0.466 |
| Assembly hall | 4 | 0.768 | death penalty | 7 | 0.466 |
| Market share | 4 | 0.768 | sand castle | 7 | 0.466 |

Table 4.5 Recurring N+N collocations in CIS and CNS

As shown in Table 4.5, the top ten most frequently recurring N+N collocations in CIS and CNS are highly pertinent to the topics of the respective speeches. For instance, the recurrent collocations *game player*, *computer game*, and *video game* in the two corpora, revolve around the topic of "game". Similarly, *product manager*, *project manager,* and *venture capital center* on the topic of "entrepreneurship". It is evident that both trainee interpreters and L1 English speakers tend to produce topic-relevant N+N collocations in interpreted speeches repeatedly. However, trainee interpreters exhibit this pattern more than L1 English speakers. The most frequently recurring N+N collocation in CIS, i.e., *science park*, was produced 21 times. The normalised frequency of *science park*, 4.032, surpasses the normalised frequency of the most recurrent N+N collocation, *science fiction*, in CNS, as reflected by the normalised frequency of 0.732. Furthermore, it is notable that the normalised frequency of the tenth most frequently recurring N+N collocation in CIS exceeds that of the most recurrent one, *science fiction*, in CNS. This disparity also indicates that trainee interpreters repeatedly use the same collocations to a larger degree than L1 English speakers, which may have contributed to the less diverse use of N+N collocations in CIS.

When it comes to N+PREP collocations, it is interesting to notice that two collocations, i.e., *(a) place for* and (*the) difference between* (Table 4.4), were repeatedly produced by both trainee interpreters and L1 English speakers. *A place for* is the most recurrent collocation in CNS and the second most recurrent in CIS. In this regard, as advanced English speakers, trainee interpreters show similar collocation preference as L1 English speakers in producing interpreted speeches. However, comparing the normalised frequency of *place for* in the two corpora, it is not difficult to discover that trainee interpreters repeated *place for* to a larger extent than L1 English users. In addition to the collocation *place for*, the other three top four collocations, *(the) relationship between, information about, knowledge about* in CIS recur more frequently than the top four collocations in CNS.

| CIS | Raw frequency | Normalised frequency | CNS | Raw frequency | Normalised frequency |
|---|---|---|---|---|---|
| relationship between | 9 | 1.728 | place for | 14 | 0.932 |
| place for | 8 | 1.536 | year after | 11 | 0.732 |
| information about | 7 | 1.344 | problem with | 11 | 0.732 |
| knowledge about | 5 | 0.960 | something about | 10 | 0.666 |
| differences between | 5 | 0.960 | thing about | 10 | 0.666 |
| Plan for | 3 | 0.576 | difference between | 9 | 0.599 |
| network for | 2 | 0.384 | reason for | 8 | 0.533 |
| in accordance with | 2 | 0.384 | contact with | 8 | 0.533 |
| story about | 2 | 0.384 | question about | 8 | 0.533 |
| speech about | 2 | 0.384 | world around | 7 | 0.466 |

Table 4.6 Recurring N+PREP collocations in CIS and CNS

The repeated use of N+N and N+PREP collocations in CIS echoes what previous studies note as the conservative tendency of collocation use in L2 English (Ädel & Erman, 2012; Chen & P. Baker, 2010) and translation (Marco, 2009; Pym, 2008). Compared with L1 English speakers, trainee interpreters seem to be more conservative in using N+N and N+PREP. They tend to repeatedly produce certain collocations rather than diversify their use of collocations. By playing safe, they may avoid producing expressions that are contextually inappropriate, which could further influence the quality of the interpreted speeches.

In addition to risk management, the repeated occurrence of certain collocations in the interpreting corpus may be from source speeches. The influence of the expressions in source speeches on the repeated use of certain collocations in interpreted speeches and other possible factors will be further analysed in Chapter Five. In addition to the frequency and diversity of collocations, this study also investigated the proportion of high-t-score and high-MI-score collocations in CIS and CNS, which reflect the complexity of collocations in these two corpora. In the next section, the complexity of collocations in the two corpora will be compared.

## 4.3 Collocation complexity

### 4.3.1 The overall complexity

As noted in Subsection 3.3.3, high MI-score favours collocations that are infrequent and less common in English. Collocations with high MI-score include components that are less likely to be found apart. The t-score measures whether a collocation is common in a language. Collocations with high t-score are frequently used in English. This study calculated the proportion of high-t-score collocations and high-MI-score collocations in relation to all collocations in CIS and CNS respectively. Then, the proportion of high-t-score and high-MI-score collocations were compared across the two corpora (see Table 4.6).

| Types of collocations | High-MI-score | High-t-score |
|---|---|---|
| CIS | 15.53% | 59.90% |
| CNS | 24.30%** | 60.07% |

*Note: Statistical significance levels: ***: $p < 0.001$ **: $p < 0.01$ *: $p < 0.05$.*

Table 4.7 The proportion of high-MI-score and high-t-score collocations in CIS and CNS

As shown in Table 4.7, CIS generally comprises a smaller proportion of collocations with high MI scores, i.e., strongly associated collocations, as compared with L1 English speeches. Among all collocations in CIS, 15.53% are strongly associated collocations. In comparison, this proportion is 24.30% for CNS ($\chi^2$ (1)=6.36, p< .01). Regarding high-t-score collocations, 59.90% of collocations in CIS are high-t-score collocations, being smaller than the 60.06% of high-t-score collocations in CNS. However, no significant discrepancy was found concerning the proportion of collocations with high t-scores between the two corpora. The results show that

The lower proportion of high-MI-score collocations in interpreted speeches implies that interpreted speeches are less collocationally complex than L1 English speeches. This finding tallies those from SLA studies, which reveal that English learners are inclined to use a smaller proportion of strongly associated collocations than L1 English speakers in English production (Durrant & Schmitt, 2009; Lorenz, 1999; Ellis et al., 2015; Granger & Bestgen, 2014). In the present study, trainee interpreters use collocations in a similar way as other English learners, which reflects a degree of conservatism (Durrant & Schmitt, 2009). Such a conservatism tendency, as suggested by Durrant and Schmitt (ibid), may lead to a perceived lack of naturalness of interpreted speeches.

Having presented findings of the overall collocation complexity of the two corpora, the following subsection moves to compare the complexity of collocations with different grammatical structures.

### 4.3.2 The complexity of the ten types of collocations

This study measured the MI-score and t-score of each type of collocation in CIS and CNS (See Table, 4.8).

| | High-MI-score | | High-t-score | |
|---|---|---|---|---|
| Types of collocations | CIS | CNS | CIS | CNS |
| V+PREP | **2.09%*** ** | **5.65%** | **85.02%** | **81.94%** |

| | | | | |
|---|---|---|---|---|
| V+ADV | 8.22% | 7.02% | **73.97%*** | **53.19%** |
| V+N | 28.95% | 26.58% | 31.20% | 37.50% |
| N+V | **1.82%** | **2.11%** | 18.18% | 22.89% |
| ADJ+N | **25.10%*** | **30.06%** | 49.37% | 54.97% |
| ADV+ADJ | **11.69%*** | **18.03%** | **83.47%***** | **70.67%** |
| N+N | **30.47%*** | **38.87%** | 28.32% | 30.29% |
| ADJ+PREP | 10.64% | 4.62% | **90.43%** | **79.41%** |
| N+PREP | 8.29% | 5.44% | 55.61% | 64.72% |
| PREP+N | **0.00%** | **0.13%** | 73.85% | 86.16% |

*Note: Statistical significance levels: ***: p < 0.001 **: p < 0.01 *: p < 0.05.*

Table 4.8 The proportion of high-MI-score and high-t-score collocations in CIS and CNS

As shown in the table, mixed results emerge when the complexity of the ten types of collocations was compared across the two corpora. CIS includes smaller proportions of high-MI-score V+PREP, N+V, ADJ+N, ADV+ADJ, N+N and PREP+N collocations, as illustrated with the bold fonts under the column of high-MI-score. In comparison. Larger proportions of V+ADV, V+N, ADJ+PREP, and N+PREP collocations were identified in CIS. However, statistically significant differences between the two corpora were only observed in the proportion of high-MI-score ADJ+N, V+PREP, ADV+ADJ, and N+N collocations, which trainee interpreters underproduced. Regarding common collocations indicated by t-score over 10, trainee interpreters produced higher percentages of high-t-score V+PREP, V+ADV, ADV+ADJ, and ADJ+PREP collocations than L1 English speakers. There are smaller proportions of V+N, N+V, ADJ+N, N+N, N+PREP, and PREP+N collocations in CIS than in CNS. Among the ten types of collocations, only the differences in the proportions of high-t-score V+ADV and ADV+ADJ collocations in CIS and CNS are statistically significant. No significant difference was observed between the two corpora with regard to the other eight types of collocations.

The above results reflect that, compared with L1 English speakers, trainee interpreters produced significantly higher proportions of strongly-associated and common V+ADV and ADV+ADJ collocations in interpreted speeches, leading to a lower degree of collocation complexity of CIS. In CIS, 73.97% of V+ADV collocations are common collocations, larger than the proportion of 53.19% in L1 English speeches. Trainee interpreters frequently produced collocations such as

*think about*, *talk about*, *come back*, *come here*, which do not occur in CIS as frequently as in CNS. As for ADV+ADJ collocations, 83.47% of them in interpreted speeches are common collocations, outnumbering the proportion of 70.67% in L1 English speeches. Common ADV+ADJ collocations, such as *very happy*, *very good*, *so many*, *very great*, occur more frequently in interpreted speeches than in L1 English speeches. The abundant use of common V+ADV and ADV+ADJ collocations in CIS indicates that interpreted speeches are less collocationally complex than L1 English speeches.

The less complex use of collocations in interpreted speeches is also reflected in the significantly smaller proportion of strongly associated V+PREP, ADJ+N, ADV+ADJ, and N+N collocations in interpreted speeches. Table 4.5 shows that the percentage of strongly associated V+PREP collocations in interpreted speeches is 2.09%. In comparison, 5.65% of V+PREP collocations produced by L1 English speakers are strongly associated collocations, outnumbering the proportion in the interpreting corpus. L1 English speakers produced strongly associated collocations such as *hanker after*, *rail against*, and *sift through*, which did not occur in interpreted speeches. Rather, to express the meaning of those natural collocations, trainee interpreters used single words, such as *filer* for *sift through*, or simpler collocations, such as *want to* for *hanker after* and *be against* for *rail against*.

In addition to V+PREP collocations, ADJ+N collocations in interpreted speeches also feature a lower degree of complexity. High-MI-score ADJ + N collocations account for only 25.10% of all ADJ+N collocations in interpreted speeches, lower than those used by L1 English speakers (30.06%). L1 English speakers produced strongly associated ADJ+N collocations such as *blissful ignorance*, *unintended consequence*, *fatal flaw*, and *conventional wisdom*, which do not occur in the interpreting corpus. When it comes to N+N collocations, interpreted speeches also include a smaller proportion of strongly associated ones than L1 English speeches (interpreted speeches: 30.47%, L1 English speeches: 38.87%). Though N+N collocations occur more frequently in interpreted speeches than in L1 English speeches (Subsection 4.1.2), interpreter'' use of this type of collocation is less complex than L1 English speakers. Strongly associated N+N collocations, such as *scuba diver*, *quantum mechanics*, *resonance imaging*, and *autograph hunter*, occurred in CNS but not in CIS. These collocations seem to be highly technical and are all related to topics of

speeches, which may be because the Chinese source speeches at the mock conferences were not as technical as speeches delivered at the TED conference. Another possibility is that trainee interpreters were not familiar with technical terms in source speeches and did not render them into the target language. Consequently, interpreted speeches do not include as many technical terms as L1 English speeches.

Apart from the aforementioned types of collocations, ADV+ADJ collocations in interpreted speeches also feature a significantly lower degree of complexity than those in L1 English speeches, as 11.69% of ADV+ADJ collocations in interpreted speeches are strongly associated collocations, whereas the proportion for non-interpreted speeches is 18.03%. One major difference between interpreters and L1 English users in their use of ADV+ADJ collocations is that interpreters repeatedly used *very* to modify adjectives. Among all ADV+ADJ collocations in CIS, 41.94% are *very*+ADJ, which are all with high t-score. In comparison, L1 English speakers tend to diversify their use of ADVs in ADV+ADJ collocations, as in *absolutely crucial* (MI score: 7.08), *incredibly powerful* (MI score: 7.12), *perfectly safe* (MI score: 7.61), which are all with high-MI-scores. Only 22.77% of ADV+ADJ collocations in CNS are *very*+ADJ collocations. Interpreters' frequent use of *very*+ADJ collocations may have contributed to the large proportion of high-t-score collocations and a smaller proportion of high-MI-score ADV+ADJ collocations in interpreted speeches. Chapter Six will further discuss the underlying cognitive reasons for the frequent use of very+ADJ collocations in interpreted speeches.

So far, the frequency, diversity, and complexity of collocations in CIS and CNS have been compared. In the next section, features of unnatural collocations will be analysed.

### 4.4 Features of unnatural collocations

This section looks into unnatural collocations in CIS, followed by an analysis of features of deviant components in unnatural collocations. As noted in Subsection 3.6.3, collocations occurring less than five times in reference corpora and cannot be traced in the three dictionaries were rated by four raters on a three-point naturalness scale: natural, unsure, and unnatural. Rating results were integrated to make the final result, based on which potentially unnatural collocations

were categorised into largely natural collocations, questionable collocations, largely unnatural collocations, and unnatural collocations. Unnatural and largely unnatural collocations were grouped as unnatural collocations (Nesselhauf, 2005).

### 4.4.1 The proportion of unnatural collocations in interpreted speeches

As noted in Chapter Three, this study extracted collocation candidates by grammatical structures from CIS and further identified natural and unnatural collocations from these collocation candidates. In total, 2980 collocations were identified from interpreted speeches (see Table 4.9). 2803 (94.06%) of these collocations are natural ones, including those that occurred at least five times in the reference corpus, found in dictionaries, and rated as natural. 49 (1.64%) collocations were rated as unsure and 128 (4.30%) as unnatural, as shown below.

| Type | ADJ+N | ADJ+PREP | ADV+ADJ | N+N | N+PREP | N+V | PREP+N | V+ADV | V+N | V+PREP | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Unnatural | 34 | 2 | 2 | 20 | 8 | 2 | 3 | 4 | 40 | 13 | 128 |
| Unsure | 14 | 1 | 1 | 11 | 8 | 0 | 1 | 0 | 11 | 2 | 49 |
| Natural | 781 | 94 | 253 | 283 | 209 | 57 | 134 | 75 | 288 | 629 | 2803 |
| Total | 829 | 97 | 256 | 314 | 225 | 59 | 138 | 79 | 339 | 644 | 2980 |

Table 4.9 Deviation rates of ten types of collocations

Despite instances where trainee interpreters produced collocations sounding unnatural to L1 English speakers, the deviation rate of collocations in CIS, i.e., 4.30%, is substantially lower than that reported in previous studies (Chang, 2018; Nesselhauf, 2005). As reviewed in Subsection 2.3.1, Nesselhauf's (2005) study discovered that one-third of the 2000 V+N collocations produced by German English learners are unnatural or questionable “unsure" in the present study). This finding is corroborated by Laufer and Waldman's (2011) results, which substantiate Nesselhauf's (2005) observation that unnatural V+N collocations accounted for a third of all V+N collocations used by L2 English learners across three proficiency levels. Similarly, in Chang's (2018) study on ADV+N, V+N, N+N, V+ADV, ADV+ADJ, and N+V collocations used by six Korean English learners, 33% of collocations are unnatural.

The 4.30% deviation rate of collocations in interpreted speeches, which is lower than that of collocations in L2 English, can be attributed to the trainee interpreters' more advanced command of English collocation knowledge compared with English learners in previous studies.

Additionally, as unveiled in Subsections 4.2.2 and 4.3.2, trainee interpreters in this study appear to be more conservative in their use of collocations, favouring common collocations and a limited range of collocations. By adhering to this strategy, trainee interpreters may avoid making mistakes that could undermine the quality of interpreted speeches, failing to meet the target audience's expectations. Such a conservative approach may account for the lower production of unnatural collocations by interpreters as compared with English learners in previous studies.

This study then compared the percentages of the ten types of unnatural collocations in interpreted speeches (see Figure 4.3).

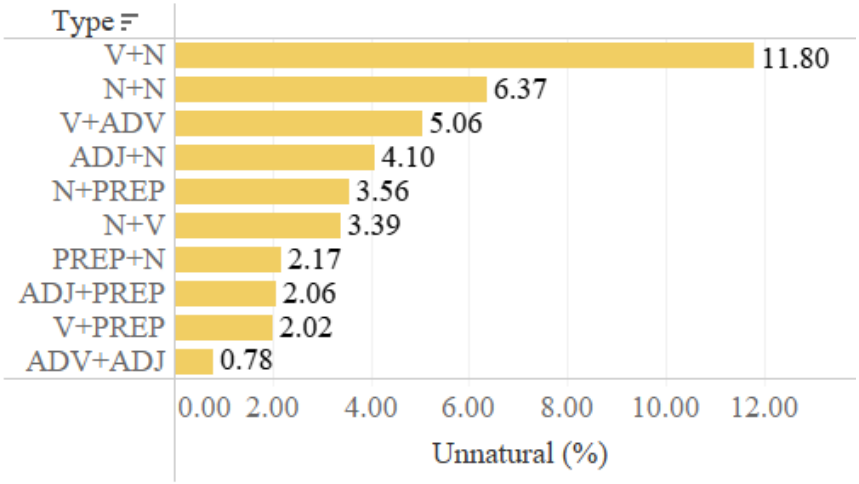



Figure 4.3 Proportion of unnatural collocations in CIS

Among these ten types, the deviation rate of V+N collocations (11.80%) was the highest, followed by N+N (6.37%) and V+ADV (5.06%) collocations. These three types of collocations may pose greater challenges to Chinese trainee interpreters in producing target speeches in L2 English. In comparison, fewer deviations were found in ADJ+N (4.10%), N+PREP (3.56%), N+V (3.39%), PREP+N (2.17%), ADJ+PREP (2.06%), V+PREP (2.02%), and ADV+ADJ (0.78%) collocations, meaning that these types could be less challenging for trainee interpreters.

The result that V+N collocation is the most challenging type for interpreters is in line with the finding of previous studies, which revealed that V+N collocations were frequent sources of difficulties for L2 English users (e.g. Howarth, 1998; Men, 2015; Nesselhauf, 2005). In the study of unnatural collocations produced by Chinese English learners in academic writing, Men (2015)

investigated three types of collocations, i.e., V+N, ADJ+N, and N+N and discovered unnatural V+N collocations account for 50.46% of all unnatural collocations, being the most error-prone type of collocation for learners. Similar ’o Men's result, the deviant rate of V+N collocations in the present study ranks the highest compared with the deviant rate of other lexical collocations, indicating that V+N collocations are major sources of difficulties for trainee interpreters in consecutive interpreting.

The deviation rate of ADJ+N collocations in the present study (4.10%) is the same as that ’n Men's (2018) study (4%), while the deviant rate of N+N collocations (6.37%) is slightly higher than that ’f Men's study (2%). These results echo the findings of previous studies that English learners are less likely to produce unnatural ADJ+N and N+N collocations than V+N collocations (e.g. Gitsaki, 1999; Siyanova & Schmitt, 2008). According to these studies (Siyanova & Schmitt, 2008; Men, 2015), since synonyms are frequent sources of deviations in unnatural collocations, the lower deviation rate of ADJ+N and N+N collocations may be because, compared with verbs, adjectives and nouns have fewer synonyms. In Men's (2015) study of unnatural V+N collocations produced by English learners, it was discovered that English learners tend to misuse synonymous verbs in V+N collocations. The author (ibid) then compared the synonyms of verbs, nouns and adjectives in V+N, N+N, and ADJ+N collocations and discovered that synonyms of verbs far outnumber adjectives, while adjectives have more synonyms than nouns. As a result, Chinese English learners misuse V+N collocations more frequently than N+N and ADJ+N collocations. Therefore, a possible explanation for trainee interpreters' more frequent misuse of V+N collocations is that verbs have more synonyms than adjectives and nouns. Having difficulties in differentiating between verbs and their synonyms, trainee interpreters tend to collocate nouns with verbs that they do not conventionally co-occur with and produce unnatural V+N collocations.

In sum, trainee interpreters produced unnatural collocations in interpreted speeches. However, compared with L2 English learners in previous studies, trainee interpreters made fewer deviations in using collocations. Of all ten types of collocations, V+N collocation is the most challenging type for trainee interpreters. The next subsection proceeds to analyse features of unnatural collocations in interpreted speeches.

### 4.4.2 Features of unnatural collocations

Having identified all unnatural collocations in CIS, this subsection further looks into the features of each type of unnatural collocation in interpreted speeches. These features were categorised into five types, namely, misusing semantically related words, missing components, component redundancy, collocation coinage, and component inversion. Table 4.4 lists the examples of each feature and its proportion. The proportion refers to the percentage of unnatural collocations of each feature out of all unnatural collocations (n=128).

| Features | Proportion | Examples |
|---|---|---|
| Misusing semantically related words | 50.78% | *pave a floor* (*pave the way)*<br>*present this meeting* (*host this meeting*)<br>*take an effort* (*make an effort*)<br>*relate with* (*relate to)* |
| Collocation coinage | 25.00% | *make the chemistry*<br>*love world*<br>*message angel* |
| Component redundancy | 17.97% | *career life* (*career)*<br>*test about* (*test)*<br>*Have perfect work (work perfectly)*<br>*Get this happiness (be happy)* |
| Missing components | 4.69% | *in end (in the end)*<br>*in past (in the past)* |
| Component inversion | 1.56% | *metal copper (copper metal)*<br>*introduce briefly (briefly introduce)* |

Table 4.10 Features of unnatural collocations

The misuse of semantically-related words involves the substitution of a word with a semantically related one and combining the misused word with another word into lexical combinations based on the perceived meaning. Consequently, interpreters produced unnatural collocations that, while not grammatically incorrect, can be confusing or misleading due to the subtle changes in meaning (e.g. *pave a floor* for *pave the way*; *present this meeting* for *host this meeting*; *take an effort* for *make an effort*; *relate with* for *relate to*). Collocation coinage refers to collocations that interpreters create for a specific context (e.g. *make the chemistry*, *love world*). Collocations featuring component redundancy include extra and unnecessary components (e.g. *career life* for *career*, *test about* for *test*), making the collocation sound unnatural. Another feature of unnatural collocations is characterised by absence of one or more components from natural collocations (e.g. *in end* for *in the end*; *in past* for *in the past*). The fifth type, i.e., components inversion, involves situations where the conventional order of components in a natural collocation is reversed (e.g. *metal copper*, *introduce briefly*). This inversion yields unnatural-sounding collocations and can lead to misunderstandings.

Misused components of unnatural collocations with different structures are analysed below to reveal how each type of collocation were misused in interpreting.

***V+N collocations***

As noted above, V+N collocation is the most challenging type of collocation for trainee interpreters. Deviations in interpreters' use of V+N collocations were categorised into lexical and grammatical deviations (see Table 4.11). Lexical deviations are mismatches among components of a collocation, including misused verbs (e.g. *accomplish many people* for *accompany many people*), misused nouns (e.g. *pave a floor* for *pave the way*), redundant verbs (e.g. *have perfect work* for *work perfectly*), redundant modifiers (e.g. *have external fun* for *have fun*), and collocations coined by interpreters (e.g. *grab the stomach* for *entice their stomachs*). Grammatical deviations mean grammatical mistakes occurring in V+N collocations, such as the misuse of determiners (e.g. *exchange this information* for *exchange information*) and missing prepositions (e.g. *arrive the destination* for *arrive at the destination*).

| **Type** | **Subcategory** | **Examples** | **Frequency** |
|---|---|---|---|
| Lexical deviations | Misused verbs | *Accomplish many* | 28 |

| | | | |
|---|---|---|---|
| | | *people* (*accompany many people*);<br>*Get her happiness* (*make her happy*);<br>*Get this happiness* (*be happy*);<br>*Take effort* (*make effort*);<br>*Have perfect work* (*work perfectly*) | |
| | Misused Nouns | *Pave a floor* (*pave the way*);<br>*Evacuate touristers* (evacuate tourists) | 4 |
| | Redundant modifiers | *have external fun* (*have fun*);<br>*have greater activities* (*have activities*) | 2 |
| | Collocations coined by the interpreter | *Grab the stomach* (*entice the stomach*) | 1 |
| **Lexical deviations in total** | | | 35 |
| Grammatical deviations | Missing prepositions | *Arrive the destination*<br>*Arrive the airport*<br>Ask some information | 4 |

| | | | |
|---|---|---|---|
| | Misused determiners | *Exchange this information* | 1 |
| **Grammatical deviations in total** | | | 5 |
| **Total** | | | 40 |

Table 4.11 Features of unnatural V+N collocations

Table 4.11 shows that most deviations in V+N collocations concern mismatch among components of the V+N collocation, i.e., lexical deviations (87.5%), and the verb is the most frequently deviant component, accounting for more than half (70%) of the deviations. This finding corroborates Nesselhauf's (2005) and Wang an' Shaw's (2008) findings that most deviations in V+N collocations lie in verbs. Given the frequent misuse of verbs in V+N collocations, the 28 cases of verb misuse were further categorised into the following five types (see Table 4.12):

| Type of verb deviation | Example | Frequency |
|---|---|---|
| Confusion of semantically related verbs | *Decrease the fear* for *reduce the fear*<br>*Form difficulties* for *create difficulties* | 15 |
| Delexical verb for lexical verbs | *Take chemotherapy* for *undergo chemotherapy*<br>*Get the intention* for *understand the intention* | 7 |
| Lexical verb for delexical verbs | *Feel an headache* for *have a headache*<br>*Pursue three demands* for *make three demands* | 2 |
| Redundant delexical verbs | *Have your reflection* for *reflect on125omen125nancei nance* for *be* | 3 |

| | | |
|---|---|---|
| | *maintained* | |
| The confusion of morphologically similar verbs | *Accomplish many people* for *accompany many people* | 1 |
| **Total** | | 28 |

Table 4.12 Verb misuses in V+N collocations

The present study uses WordNet[19] to evaluate the semantic relation between two verbs. WordNet is an on-line lexical database that groups words according to the meaning they carry and displays the semantic domain a word belongs to. It enables the present study to evaluate whether two verbs are semantically related. As Table 4.12 shows, the confusion of semantically related verbs is the most common in verb deviations of V+N collocations. Of the 15 cases of confusion of semantically-related verbs, each verb has a similar semantic content with the verb in the recommended collocation raters provided. That means interpreters may have difficulties differentiating verbs with their synonyms when using V+N collocations.

For instance:

> Example (1) If she were dead now, I wouldn't *drop any tears* at all. (Interpreter 54)
>
> Example (2) So it provides them with a space in the platform for the family and friends to come together and communicate with each other, and also to help them *decrease the fear* in the journey fighting cancer. (Interpreter 20)

As illustrated in the first example, the interpreter misused the verb *drop* for *shed*. In L1 English, *shed* habitually co-occurs with *tears* to denote the meaning of tears falling in English. According to the result displayed by WordNet, *shed* and *drop* both denote the meaning of getting rid of. It is likely that the interpreter combined the verb *drop* rather than *shed* with *tears* to convey the meaning of *shed tears* because the collocation *shed tears* was not stored in the mental lexicon of the interpreter as a whole chunk, or because this collocation is stored in a less accessible part of the mental lexicon, which takes longer to retrieve during interpreting. Another possibility is that *drop* is a literal translation of the Chinese word *掉*, which always co-occurs with *眼泪* (tears) in Chinese. Influenced by the Chinese expression *掉眼泪* (drop tears), the interpreter rendered the unnatural collocation *drop any tears* word for word from Chinese.

[19] https://wordnet.princeton.edu/

A similar tendency of confusing synonymous verbs in V+N collocations is seen in Example (2). In Example (2), the trainee interpreter misused *decrease* for *reduce* and combined *decrease* with *fear* to convey the meaning of *reduce the fear*. According to the raters, both *decrease* and *reduce* carry the meaning of making a quantity smaller. However, *decrease* does not collocate with *fear* in English. One rater notes, "I understand the meaning of *decrease the fear*, but it sounds awkward" (rater 4). In this example, the trainee interpreter confused the two semantically related verbs, producing collocations simply by combining words based on the perception of their meaning rather than the habitual co-occurrence of two words in English.

Trainee interpreters are not alone in having difficulties in differentiating semantically related verbs when using V+N collocations. Semantically related verbs constitute a major source of deviations in V+N collocations in L2 English (Men, 2015; Nesselhauf, 2005). Nesselhauf (2005, p. 91) discovers that verbs with the concept of *carrying something out* in V+N collocation are confused by German English learners, as in *practice sport* for *participate in sport* and *carry out a race* for *hold a race*. Comparing frequencies of V+N deviations concerning synonymous verbs among Chinese English learners of different proficiency levels, including high school students, non-English major university students and English major university students, Men (2015) discovers that deviations in V+N collocations produced by advanced-level English learners are more restricted to the confusion of verbs and their synonyms. This finding indicates that the more proficient English learners become, the more verbs they acquire in synsets, and the more likely they are to confuse verbs with their synsets using V+N collocations. Similarly, as advanced English users, trainee interpreters tend to misuse verbs with their synonyms in producing V+N collocations, meaning that they may have many verbs in synsets stored in the mental lexicon and have difficulties differentiating verbs with similar meanings and identifying the habitual use of verbs with similar meanings. Consequently, when producing V+N collocations, they tend to combine verbs with nouns based on the perceived meaning of these verbs and nouns rather than drawing V+N collocations as a whole chunk from the mental lexicon, which may have caused deviations in the collocation they produce.

In addition to the confusion of semantically related verbs, another type of verb deviation in V+N collocations concerns the misuse of delexical verbs, including the misuse of delexical verbs for lexical verbs, the misuse of lexical verbs for delexical verbs, and the redundant use of delexical

verbs. Delexical verbs such as *take*, *make*, and *do*, are verbs w“th a ”light" semantic content, as opposed“to a ”heavy" (or lexically more specified) one, such as *eat*, *undergo*, *read*, and *write* (Cowie, 1992). In a delexical verb+ noun collocation, the delexical verb is semantically vague, and the noun is semantically specific (Algeo, 1995). The noun is the main contributor to the meaning of the collocation. The six most common delexical verbs are *do, give, have, make, take,* and *get* (Kaszubski, 2000; Wang, 2011).

In seven unnatural V+N collocations in CIS, delexical verbs were misused in contexts where lexical verbs should be used:

> Example (3): And what the reason why she had this extramarital affair with Sha Chenxing, a married man, is because she thinks he can *get her happiness*. (Interpreter 27)
>
> Example (4): She knows what she wants and she will sacrifice anything to *get this happiness* in all the means available. (Interpreter 30)

In both examples, trainee interpreters misused the delexical verb *get* in V+…+N collocations. In Example (3), the interpreter misused *get her happiness* for *earn her happiness*, *give her happiness* or *make her happy*. Rater 3 notes, "I understand what it means, but happiness is not something we get in English". It seems that in this example, the interpreter combined *get* and *happiness* to convey the meaning of *make her happy*. Similarly, in Example (4), *get* was suggested by L1 English raters to be replaced by *achieve*, *find* or *obtain*, as *get this happiness* does not habitually occur in English. In these examples, interpreters seem to have been influenced by the Chinese collocation *获得幸福,* which can be translated word for word into English as either *obtaining happiness* or *getting happiness*. When producing the two collocations, i.e., *get her happiness* and *get this happiness*, interpreters tend to use the delexical verb with a general meaning rather than to use verbs with specific meanings, though the delexical verb *gets* does not habitually co-occur with the noun *happiness*.

In addition to misusing delexical verbs for lexical verbs, trainee interpreters constructed V+N combinations that include unnecessary or redundant delexical verbs, as in Examples (5) and (6):

> Example (5) And although you may think= find it abstract or trivial, I think= I hope it can be a trigger for you to *have your reflection* on your own path… (Interpreter 6)
>
> Example (6) ’ell I'm not saying that we *have perfect work*. (Interpreter 63)

In the two examples, the use of the delexical verb *have* was redundant. Both *have your reflection*

and *have perfect work* sound unnatural to L1 English raters, and the two collocations may be replaced by two more appropriate verb phrases: *reflect upon* and *work perfectly*. The two examples indicate that interpreters tend to generate V+N collocations based on delexical verbs and may not know whether the delexical verb and the noun formulate a natural collocation.

In another two cases, lexical verbs were produced when delexical verbs were more appropriate in the collocations:

> Example (7) But I only *feel a headache*. (Interpreter 53)
>
> Example (8) So he wants to *pursue three demands from* three different people. (Interpreter 28)

In Examples (7) and (8), *feel a headache* and *pursue three demands from* were rated as unnatural by three raters. Trainee interpreters misused the delexical verb *feel* for *have* in the collocation *have a headache* and produced the unnatural collocation *feel a headache*. In Example (8), the delexical verb *pursue* was misused for *make*, because *make* habitually co-occurs with *demands* to convey the meaning of requiring someone to do something. The two examples further imply that interpreters may be unaware of the difference between lexical and delexical verbs with similar meanings and lack knowledge of nouns collocating with these two types of verbs. Consequently, trainee interpreters confused lexical and delexical verbs in V+N collocations.

The confusion of lexical and delexical verbs in V+N collocations has been observed in L2 acquisition studies (Men, 2015; Wang & Shaw, 2008). Wang and Shaw (2008) discover that Chinese English learners tend to use delexical verbs than lexical verbs in producing V+N collocations. This may be attributed to learners' lack of awareness of the compatibility of components of V+N collocations. As noted by Källkvist (1999), verbs with general meaning are easy to understand and are acquired by language learners at an early stage. Therefore, language learners tend to use delexical verbs rather than lexical verbs at an early stage. As English learners proceed to an advanced level, they produce more lexical V+N collocations and fewer delexical V+N collocations (Men, 2015). In this process, without knowing the usage restrictions of lexical and delexical verbs, learners may tend to confuse delexical verbs with lexical ones in producing V+N collocations. In the present study, trainee interpreters are advanced English learners. Their difficulties in using lexical and delexical verbs in V+N collocations may be because interpreters have acquired a certain number of delexical verbs and lexical verbs. However, these verbs may

have been memorised as single words rather than with other words that collocate with them. As a result, in conveying an intended meaning, trainee interpreters may have combined single words and produced collocations that do not naturally occur in English. Another possibility is that they knew these collocations in normal circumstances but under the pressure of limited time and multitasking during interpreting, they could not allocate enough mental capacity to gain access to the less accessible lexical verbs in their mental lexicon.

Another category of deviation evident in unnatural V+N collocations pertains to the nouns employed. In one case, a non-existent noun in English was used in a V+N collocation:

> Example (9) …we have set up the disaster prevention measures and also other measures to *evacuate touristers*. (Interpreter 77)

In this example, *touristers* instead of the correct term, *tourists* was used. The interpreter appears to have applied the suffix -er to indicate the agent performing the action of touring, manifesting an incorrect adoption of English language rules.

In a separate instance, an interpreter confused a noun in a V+N collocation with its semantic equivalent:

> Example (10) So all my stories was just *pave a floor* for my topic today. (Interpreter 2)

In this instance, the interpreter appears to have confused the noun *floor* with *way*, demonstrating a lack of awareness that *pave the way* is a standard phrase in English. For the collocation *pave the floor*, one of the raters notes, "I understand what it means, but *paving the way* is more common in English".

Examples (9) and (10) underscore the fact that deviations in V+N collocations can arise from misconceptions about the specific nouns that can appropriately form these collocations. The misuse of nouns—either through the creation of non-existent terms or the substitution of correct nouns with semantically related but contextually incorrect alternatives—indicates possible gaps in the interpreters' lexical knowledge and familiarity with common English expressions and the possible influence of the cognitively demanding nature of interpreting.

Apart from lexical deviations, five cases of grammatical deviations, including four missing prepositions and one misused determiner, have been observed in unnatural V+N collocations.

Examples of missing prepositions are *arrive (at) the airport* (interpreter 76), *arrive (at) the destination* (interpreter 76), *care (for) your friends* (interpreter 25), and *ask (for) some information* (interpreter 53). In these cases, interpreters appear to lack an awareness that intransitive verbs should not be followed by objects directly and should be followed by prepositions. The missing preposition in V+N collocations may be further attributed to the influence of interpreters' L1, which will be further discussed in Chapter Six. This trend of preposition omission echoes the findings of Wang and Shaw (2008), who discover that some deviations in unnatural V+N collocations reflect grammatical problems L2 English users face rather than the unawareness of the collocability of components of a collocation. Likewise, the omission of prepositions in V+N collocations in CIS indicates that interpreters may encounter grammatical difficulties when using collocations and consequently produce ungrammatical collocations. As Erman and Warren (2000, p. 52) content, not all collocations allow inflectional variabilities such as the change of preposition, voice, and a determiner. Thus, for trainee interpreters, the production of natural collocations extends beyond merely discerning which words can form a collocation. Interpreters must also understand the grammatical rules underpinning the formation of the collocation.

***N+N collocations***

In addition to V+N collocations, N+N collocations emerged as the second most common source of errors for trainee interpreters. The analysis of unnatural N+N collocations has revealed four distinct types of deviations, including misused modifier nouns, collocations coined by the interpreter, redundant head nouns, and inverted head nouns and modifier nouns (Table 4.13).

| Types of Deviation | Examples | Frequency |
|---|---|---|
| Misused modifier nouns | *Advantages method* for *advantageous method*<br>*Fear scenes* for *scary scenes*<br>*Dressing code* for *dress code* | 8 |
| Collocations coined by the interpreter | *Love world* for *the romantic world*<br>*Lad force* for *load*<br>*Breath exampler* for *breath analyser* | 6 |
| Redundant head nouns | *Career life* for *career* | 5 |

| | | |
|---|---|---|
| | *Innovation points* for *innovation* | |
| Invert head nouns and modifier nouns | *Metal copper* for *copper metal* | 1 |
| **Total** | | 20 |

Table 4.13 Features of unnatural N+N collocations

The misuse of the modifier nouns occurs most frequently in unnatural N+N collocations. Among the eight instances of misused modifier nouns, four concern the wrong choice of the part of the speech of the word. Interpreters tend to use a pre-modifier noun when the adjective form of the noun should be used.

For instance:

Example (11) So, you can experience Christmas and get the ***festivity feelings***. (Interpreter 70)

Example (12) Well, actually there was a lot of interesting nicknames revolving around her which can erm symbolise her er very interesting ***architect ideas***. (Interpreter 21)

In Examples (11) and (12), interpreters incorrectly use *festivity* and *architect* for their adjective forms, *festive* and *architectural*. The same tendency of using nouns for adjectives has been observed ’n Men's (2015) study: in unnatural N+N collocations produced by advanced Chinese English learners, 83% of deviations concern the confusion between pre-modifying nouns and their adjective forms. Men (ibid) explains that adjectives and nouns function as modifiers of nouns in English, while N+N collocations are more common in Chinese. Under the influence of L1, learners are prone to use nouns as pre-modifiers when an adjective should be used to modify a head noun. In the present study, the misuse of pre-modifier in N+N collocations may also be attributed to the influence of Chinese expressions, either in trainee interpreters' mental lexicon or in source speeches, which will be discussed in Chapter Six.

Six (30%) of the 22 unnatural N+N collocations do not exist in English and were coined by interpreters. For instance:

Example (13) So when it comes to Christmas Eve you will be able to find a full picture like this. And the ***message angels*** can fly because they take themselves fly. (Interpreter 59)

In Example (13), the interpreter uses *message angel* to refer to the Christmas messenger, which is likely to result from a lack of knowledge of collocations with cultural connotations. Not knowing

the collocation *Christmas messenger*, the interpreter seems to have translated the Chinese word *信* (message) *使* (angel), meaning messenger, into English in a word-for-word manner. The Chinese word *信* (message) is translated into *message*, and *使* (angel) *angel*. It seems that when interpreters do not know an N+N collocation, they tend to resort to L1 and translate the N+N collocation in L1 into English literally, which may lead to unnaturalness. Another possibility of the production of *message angel* is that the Chinese expression *信使* occurs in source speeches and was interpreted word for word into the English expression *message angels* by the interpreters. Such an influence on the interpreting process will be further examined in Chapter Five.

In another example, the trainee interpreter seems to have coined an English collocation by translating a Chinese expression word for word into English. This linguistic invention based on L1 may have served to compensate for a lack of familiarity with the corresponding target language collocation.

Example (14) So after graduation, he focused on establishing this technology which is a *breath exampler*. (Interpreter 37)

In Example (14), the interpreter used *a breath exampler* to refer to *the exhaled breath test*, a test for lung cancer diagnosis. It seems that the interpreter does not know the name of the test and creates a collocation based on the Chinese name of the test, *呼吸分析仪* (breath analyser). Not knowing the English expression of *分析仪* (analyser), the interpreter creates a word, *exampler*, to form a word combination with the noun *breath*. However, the N+N combination does not exist in English.

In addition to the misuse of modifier nouns and coined collocations, the redundant use of head nouns and the inversion of the head noun and the modifier are observed in unnatural N+N collocations. Interestingly, some redundant nouns in unnatural collocations reflect the influence of interpreters' L1. One example is provided here to illustrate such an influence:

Example (15) And I also have tons of experiences thinking about my *career life*. (Interpreter 6)

In Example (15), the word *life* in the collocation *career life* is redundant. The trainee interpreter added an extra word *life* after *career* to refer to career. However, *career life* is not a collocation in L1 English. Translating *career life* word for word into Chinese, one would find that the Chinese

translation *职业生涯* (career life) is natural. Therefore, in this example, the trainee interpreter seems to have been influenced by the surface structure of an expression in Chinese. The influence of interpreters' L1 will be further discussed in Chapter Six.

***V+ADV collocations***

In addition to V+N and N+N collocations, V+ADV collocations are the third most error-prone type of collocation for trainee interpreters. Though unnatural V+ADV collocations account for 4.12% of all V+ADV collocations in CIS, there are only four unnatural V+ADV collocations in the interpreting corpus. That is because trainee interpreters did not frequently produce V+ADV collocations. Among the four cases of unnatural V+ADV collocations, two feature the misuse of an adverb for a preposition, one is characterised by the inversion of the verb and the adverb, and one unnatural collocation was coined by the trainee interpreter. All instances of unnatural V+ADV collocations indicate trainee interpreters' lack of awareness of the habitual co-occurrence of words in English.

In the following example, the trainee interpreter incorrectly used the adverb *upwards* when the appropriate word choice should be the preposition *up* in the V+ADV collocation.

> Example (16) *And it also works as a staircase for them to get upwards into the building.* (Interpreter 58)

In this example, the trainee interpreter intended to convey the meaning of *get up*. Yet, the interpreter seems to have confused the adverb *upwards* with the preposition *up*, producing the unnatural collocation *get upwards*. This confusion may be due to the semantic proximity of *up* and *upwards*, as both words embed the meaning of the movement towards a higher level. This example illustrates the trainee interpreter's tendency to confuse semantically related words.

***ADJ+N collocations***

Among the 34 unnatural ADJ+N collocations, 22 (64.71%) are deviant because of the misuse of adjectives, and 12 (35.29%) include misused nouns (Table 4.14). The adjective is the most error-prone component in ADJ+N collocations.

| Types of Deviation | Examples | Frequency |
|---|---|---|
| Misused adjectives | *Struggling topic* for *difficult topic* | 22 |

| | | |
|---|---|---|
| | *Gentle feature* for *soft feature*<br>*Curvy wall* for *curved wall*<br>*Incredible efficiency* for *high efficiency* | |
| Misused nouns | *Average avenue* for *average income*<br>*Inspirational sharing* for *inspirational talk*<br>*Religious sightseeing* for *religious sights* | 12 |
| **Total** | | 34 |

Table 4.14 Features of unnatural ADJ+N collocations

Some unnatural ADJ+N collocations feature confusion with synonymous words. 18 of the 22 instances of adjective misuse occur in ADJ+N collocations because interpreters are not able to differentiate between semantically related adjectives, as in *gentle features* for *soft features* (interpreter 24), *incredible efficiency* for *high efficiency* (interpreter 33), *inside emotions* for *internal emotions* (interpreter 45), *mature mechanism* for *established mechanism* (interpreter 41).

In the following example, the interpreter confused two semantically related adjectives and produced an unnatural ADJ+N collocation.

> Example (17) Because er it's also a= a very ***struggling topic*** for me when I was studying in the university. (Interpreter 11)

In Example (17), *struggling topic* should be revised to *difficult topic*. The interpreter misused *struggling* for *difficult*, which may be because both words are relevant to *difficulty*, though *struggling* concerns a person's feeling or status and cannot be used to modify the inanimate noun *topic*. The misuse of synonymous adjectives indicates that when an ADJ+N collocation is not stored in their mental lexical, trainee interpreters tend to combine adjectives with nouns according to their meaning, which may generate unnaturalness.

Twelve unnatural ADJ+N collocations feature noun misuses, among which nine cases seem to be the result of what Howarth (1998, p. 40) refers to as the "experimentation" strategy adopted by English learners in producing collocations. As Howarth notes, L2 English user are "risk-takers" (ibid), and when they do not know a collocation, they tend to use synonyms of collocation components and create a collocation that does not exist in English. In the present study, interpreters use semantically relevant words of nouns that habitually co-occur with the adjective.

For instance:

Example (18) Pipe organ is mainly a *religious musical* and in the cathedrals, it is an organ mainly built and constructed along with the building of the cathedral. (Interpreter 14)

In Example (18), the interpreter uses the noun *musical* for *instrument*, which may be due to the fact that both words are relevant to *music*. This example further confirms that trainee interpreters may tend to combine lexical items based on the meaning of the words or grammatical rules rather than draw lexical chunks as whole units directly from their memory in speech production. Another example of experimentation is:

Example (19) So er as we said before the= a square must be for public use= er for *public purpose* and it needs to be spacious. (Interpreter 70)

In this example, the unnatural collocation *public purpose* was produced to convey the meaning of *public use*, which should be the correct collocation in this sentence. The interpreter used *public use* first but then revised the collocation to *public purpose*, meaning that the interpreter has difficulty differentiating between *use* and *purpose*, both of which are relevant to the meaning of *target* and *aim*.

***N+V collocations***

Compared with the other types of collocations, unnatural N+V collocations occur less frequently in CIS. Two unnatural N+V collocations (*God locates*, *factory causes*) were identified in the interpreting corpus, featuring the misuse of verbs, which can be further attributed to the aforementioned "experimentation" strategy of interpreters. That is, when producing the two N+V collocations, trainee interpreters used synonymous verbs of the verbs or expressions that should be used in the collocations. In the following example, the trainee interpreter used the verb *locate* to denote the meaning of *the God is from*. This choice was likely made because both *is from* and *locate* have the meaning of location. However, the trainee interpreter appears unaware that *locate* does not conventionally co-occur with *God* in English.

Example (20) And this is because that in the Bibles the *God locates* in the east part, which is why most of the cathedrals are designed in this setting. (Interpreter 14)

Furthermore, in this instance, the trainee interpreter does not know the cultural connotation of "God comes from the East"- a Christian tenet positing that God is from the East. Such a lack of understanding may be owing to the fact that this cultural connotation is not part of Chinese culture. Given that language forms a vital component of culture and that the latter can influence

the former, it is plausible, as Lu (2016) suggests, that the cultural disparities between Chinese and English may have also played a role in the unconventional use of "God locates" in interpreted speeches.

***ADV+ADJ collocations***

Trainee interpreters also produced two unnatural ADV+ADJ collocations (*already visual*, *gradually proud*) in interpreted speeches, which feature adverb redundancy. For instance:

> Example (21) So AR navigation is a supplementary of your *already visual* experience. It will enhance your visual experience. (Interpreter 74)

In this example, the trainee interpreter produced an unnatural collocation *already visual* to convey the meaning of the original visual (experience). However, in the context of this sent“nce, "supplementary" implies that the *visual experience* was the original experience. Therefore, the adverb *already* in *already visual* is redundant. After generating the collocation *already visual*, the interpreter seems to realise the inappropriateness of the collocation and added a sentence, i.e., it will enhance your visual experience, to make the interpreted speech more understandable to audiences. The unnatural collocation *already visual* can be translated word for word to the Chinese expression *原有的视觉* (original vision), which indicates that the influence of interpreters' L1 may have played a role in the occurrence of *already visual*. This example will be further analysed in Chapter Five and Chapter Six.

***Grammatical collocations***

In addition to the six types of collocations analysed above, the other four types of collocations, i.e., N+PREP, ADJ+PREP, V+PREP, and PREP+N collocations, are analysed under the umbrella term of grammatical collocations. That is because these four types of collocations all include prepositions, and the inappropriate use of prepositions is a common feature of unnatural grammatical collocations. As reviewed in Subsection 2.2.3, a grammatical collocation consists of "a dominant” word“ and "a particle" (Benson et al., 2010: xiii). The dominant words include nouns, adjectives/participles, and verbs; the particle refers to a preposition, an adverb, or a grammatical structure such as an infinitive or a clause. In the context of this section, a grammatical collocation is composed of a dominant word (a noun, a verb, or an adjective) and a preposition (Bensen et al., 2010).

Deviations in grammatical collocations are categorised into two types: grammatical and functional deviations (Bychkovska & Lee, 2017; Huang, 2015; Viana, Zyngier & Barnbrook, 2011). Grammatical deviations, also referred to as morphological errors by Huang (2015), mean the inappropriate use of components within a collocation. For instance, in ADJ+PREP collocation *(is) similar from (me)* (interpreter 5), the preposition *from* is incorrectly used, making *similar from* an unnatural collocation. The correct expression should be *similar to*. Therefore, *similar from* is a grammatically unnatural collocation. Functionally deviant collocations "fail to constitute a larger grammatically and functionally correct unit" with other words or sequences in a sentence (Huang, 2015, p. 17) and do not collocate with other words or word sequences in the context of a sentence or a text. For instance, in *In my opinion, I agree with the latter one* (Huang, 2015, p.17), the meaning of *in my opinion* overlaps that of *I agree with*. In L1 English, *in my opinion* should be followed directly by the speaker or the writer's opinion or argument. Therefore, the use of *in my opinion* is considered unacceptable in this example. Both grammatical and functional deviations have been identified in CIS.

Among the 26 unnatural grammatical collocations in CIS, 25 are grammatically deviant, and one is functionally inappropriate (see Table 4.15).

| Type | Subcategory | Examples | Raw Frequency |
|---|---|---|---|
| Grammatical deviations | Preposition misuse | *Definition about* for *definition of*<br>*Interpretation about* for *interpretation of*<br>*Similar from* for *similar to*<br>*Supplementary of* for *supplementary to*<br>*(Be) related with* for *be related to* | 12 |
| | Redundant prepositions | *Feature with* for *feature* | 10 |

| | | | |
|---|---|---|---|
| | | *(be) called as* for *(be) called* | |
| | Missing articles | *In end* for *in the end*<br>*In past* for *in the past* | 2 |
| | Misused noun | *Intention from* for *attention from* | 1 |
| **Grammatical deviations in total** | | | 23 |
| Functional deviations | A functional deviation | *Make… into implementation* for *carry out* | 1 |
| **Functional deviations in total** | | | 1 |
| **Total** | | | 26 |

Table 4.15 Features of unnatural grammatical collocations

Features of unnatural grammatical collocations include misused prepositions (*be related with*), redundant prepositions (*feature with*), missing articles (*in end*), misused nouns (*intention from*), and a functional deviation (*into implementation*). 12 of 26 (46.15%) deviations in ungrammatical collocations are preposition misuses. Interpreters seem to have difficulties in differentiating between *of* and *for* and between *of* and *about* in N+PREP collocations:

Example (22) Ye Hang is still a brave *defender for* love. (Interpreter 28)

Example (23) Some give us a brief *summary for* my presentation. (Interpreter 26)

Example (24) My *interpretation about* Ye Hang is that Ye Hang is th' love's fool. (Interpreter 28)

Example (25) … the *interpretation about* it was really good. (Interpreter 59)

In the above four examples, trainee interpreters use prepositions *for* and *about* to connect head nouns (*defender*, *summary*, *interpretation*) and their complements (*love*, *my presentation*, *Ye Hang* and *it*) based on an inaccurate perception of the logical relation between the head nouns and the complements. In Examples (22) and (23), interpreters perceive that the complements *love*

and *my presentation* are the beneficiaries of the head nouns *defender* and *summary*. Therefore, the preposition *for*, which denotes a beneficiary relation between nouns (Huddleston & Pullum, 2005), is selected to connect the head nouns and the complements. However, in both examples, the complements, i.e., *love* and *my presentation*, contribute to and complete the meaning of the head nouns. As for Examples (24) and (25), trainee interpreters connect the head noun *interpretation* and the complements *Ye Hang* and *it* with the preposition *about*, which denotes a meaning of *being relevant to*. However, *Ye Hang* and *it* complement the meaning of *interpretation* and extend the meaning of *interpretation*. In all these four examples, the preposition *of*, as raters suggest, is more appropriate because all complements serve as independent contributors to the meaning of the head nouns, and the use of grammaticised preposition *of* can convey this logical relation between nouns. In English, some prepositions (e.g. *before*, *after*, *above*) have meanings, while others have no identifiable meanings and mainly play grammatical roles (Huddleston & Pullum, 2005). The preposition *of* is highly grammaticised. The literal meaning of *of* is *away*/*from*, denoting the genitive relation between the head noun and the complement (ibid). Independent of the collocation in which it occurs, grammaticised *of* has no meaning and can be used with complements to contribute to the meaning of head nouns. Therefore, the preposition *of* is more appropriate for the four N+PREP collocations.

A similar trend of misusing other prepositions for the preposition *of* has been observed by Yuan (2014) in a study of prepositions produced by Chinese English learners in writings. Yuan discovers that these learners prefer to use *for* to denote the relation of beneficiary between words and use *of* for the relation of possession between nouns in English writing, even if the logical relations are not as what the L2 learners perceive. Yuan (ibid) attributes the misuse of prepositions in N+PREP collocations to the typological difference between Chinese and English, suggesting that since there are no grammaticised prepositions in Chinese, Chinese English learners may find it difficult to understand how the grammaticised preposition *of* should be used. In the present study, interpreters may also be influenced by Chinese when acquiring and using prepositions, which will be further discussed in Chapter Six.

Preposition redundancy is another common feature of unnatural grammatical collocations in CIS. Among the 26 unnatural collocations, 10 (38.46%) feature a preposition redundancy, all of which occur in V+PREP collocations. A typical example is *feature with*, which occurs in the interpreted

speeches of three interpreters:

Example (26) It presents a very sharp edge *featuring with* a very dull atmosphere. (Interpreter 24)

Example (27) And this erm slicing router is *featured with* fifty GbE excess capacity. (Interpreter 26)

Example (28) It is the architecture that is *featured with* cottage-like characteristics. (Interpreter 17)

In the three examples, raters suggest that the preposition *with* is redundant and can be omitted. In English, *with* has a meaning of *property* and *feature*, as in *a boy with black hair* and *someone with intelligence* (Huddleston & Pullum, 2005, p. 661). Interpreters may have identified the context in which the verb *feature* occurs and attempted to stress the verb's meaning by using a similar preposition. However, interpreters seem unaware that the verb *feature* does not collocate with the preposition *with* habitually in English. As a result, preposition redundancy occurs. Preposition redundancies are also identified by Yuan (2014) in the English academic writing of Chinese students. In Yuan's study, students produce collocations such as *marry with* and *accompany with,* in which the prepositions are semantically repetitive to the verbs. According to Yuan (2014), L2 English learners may have unconsciously associated the preposition *with* with the Chinese expression 有 (to have) and 跟 (to follow, to accompany). When learners produce a verb denoting the meaning of 有 (to have) and 跟 (to follow, to accompany), they may feel that the single verb cannot denote the meaning and would use the preposition *with*, which is associated with learners' L1, to help clarify the meaning of the verb. It remains unknown whether trainee interpreters in this study consciously rely on Chinese expressions to produce collocations. However, the three examples reflect the possible influence of interpreters' L1 on their use of prepositions in collocations. It seems that trainee interpreters have also associated the preposition *with* with the Chinese expression *有* (to have) and the concept of *to have*. When producing the verb *feature*, trainee interpreters may have been interfered by the Chinese expression 有…的特点 (have … feature) and then used the preposition associated with the meaning of *to have* to clarify the meaning of *feature*. Consequently, the unnatural collocation *feature with* was produced.

A possible cause of difficulties trainee interpreters have in using prepositions may be the

typological difference between Chinese and English (Bychkovska & Lee, 2017; Huang, 2015; Yuan, 2014). English is a hypotactic language, whereas Chinese is paratactic (Shao, 2013; Ping, 2009). In hypotactic languages, logical and semantic relations among words or sequences within a sentence are usually clearly marked by cohesive devices such as prepositions; in paratactic languages, such relationships are expressed with lexis or implied in the context. An overt marking of cohesion is often optional or unnecessary in paratactic languages such as Chinese. Though used more frequently in English, prepositions can be dropped at no loss of meaning in some sentences in Chinese (Lian, 1993; Yu, 1993). For instance:

> *至于* 念书 和 写字，我 还 没 找到个 清净的 地方呢。
>
> *As for studying and writing, I have not yet found a quiet place* (Chao, 1968, p. 753, cited in Yu, 1993).

In the Chinese sentence and its English translation, prepositions *至于/as for* introduce the main clause *念书和写字*/studying and reading. In the English translation, the preposition is indispensable to make the sentence grammatically correct. In comparison, the Chinese counterpart of *as for* can be omitted without influencing the grammatical correctness of the sentence, as in:

> 念书 和 写字， 我 还 没 找到个 清净的 地方呢。
>
> *Studying and writing, I have not found a quiet place.*

The infrequent use of prepositions in Chinese makes English prepositions challenging for Chinese L2 English learners to acquire (Hinkel, 2003; Bychkovska & Lee, 2017). In the present study, the misuse of prepositions in grammatical collocations may be due to interpreters' lack of knowledge of how English prepositions can be used to denote logical relations between words.

Apart from preposition misuse and redundancy, two cases of missing articles in unnatural PREP+N collocations were identified:

> Example (’29) I'm sure er *in end*, I want to use the ’aggie's words that we can see on the PowerPoint. (Interpreter 26)
>
> Example (30) And I think as of today, I'm the speaker and *in past* I was the interpreter. (Interpreter 6)

In Examples (29) and (30), the article *the* is missing, which may also be associated with the typological difference between Chinese and English. A similar type of mistake (*on other hand*) has been observed by Bychkovska and Lee (2017, p. 47). The two authors explain that Chinese

English users miss articles because Chinese is an article-less language. Previous studies (Diez, Bedmar, & Papp, 2008; Snape, 2008) reveal that learners of an article-less L1 have difficulties using English articles. Furthermore, it is observed that English learners have problems in using English articles in generic contexts (Cho & Slabakova, 2017) because article-less languages use zero articles for all forms of generic reference. In contrast, in English, the definite article can be used for generic references in a definite singular context, as in *in the end* and *in the past*. In examples (8) and (9), *in end* and *in past* seem to be transferred from Chinese collocations 到最后 (in the end) and 在过去 (in the past), which are Chinese PREP+N collocations without articles. Therefore, the occurrence of article-less PREP+N collocations in CIS may be caused by the incongruence of interpreters' L1 and L2.

## 4.5 Summary

This chapter has answered RQ 1 and RQ2. In answering the first research question, *what are typical collocation features of interpreted speeches when compared with L1 English speeches*, the frequency, diversity, and complexity of collocations in interpreted speeches were compared with those in L1 English speeches. Findings indicate that, generally, interpreted speeches are less collocationally conventional than L1 English speeches. Interpreted speeches include fewer collocations than L1 English speeches and feature a lower degree of collocation diversity and complexity. Mixed findings emerged when collocations were categorised into ten types by grammatical structures. Interpreters underproduced five types of collocations, specifically A+N, N+V, V+ADV, V+…+N, and V+PREP, but overused the other five types of collocations i.e., ADJ+PREP, ADV+ADJ, N+N, N+PREP, and PREP+N, compared with L1 English speakers. A further comparison of the diversity of each type of collocation in the two corpora reveals that though interpreters overused N+N and N+PREP collocations, these two types of collocations in the interpreting corpus are significantly less diverse than the same types of collocations in L1 English speeches. Trainee interpreters repeatedly produced a small range of N+N and N+PREP collocations in interpreted speeches. When it comes to the complexity of the ten types of collocations, results show that there are a smaller proportion of strongly associated V+PREP, ADJ+N, ADV+ADJ, and N+N collocations in interpreted speeches than in L1 English speeches. Moreover, V+ADV and ADV+ADJ collocations produced by trainee interpreters comprise a larger proportion of common collocations. Trainee interpreters use those six types of collocations in a simpler manner than L1 English speakers.

In answering the second research question, this section reveals that interpreters made deviations in producing all ten types of collocations. They combined words based on each word's perceived meaning, unaware of whether the two words conventionally co-occur in English. Similar to L2 English learners, interpreters made errors most frequently in using V+N collocations, though the deviation rate of V+N collocations in interpreting is not as high as what has been observed in other studies on L2 English. Deviant components of the ten types of collocations have been analysed in this chapter. The confusion of semantically related words is the most prevalent among all features of unnatural collocations, having been observed in V+N, V+ADV, N+V, N+N, and ADJ+N collocations. In addition, some components of unnatural collocations are redundant. Such redundancy is observed in ADV+ADJ, V+N, N+N, and V+PREP collocations. Trainee interpreters also made deviations in the word order of collocations and inverted the words of natural collocations. Consequently, unnatural V+ADV and N+N collocations were produced. Furthermore, grammatical deviations, such as missing articles and the misuse of prepositions, have been identified in V+…+N, N+PREP, ADJ+PREP, V+PREP, and PREP+N collocations.

When analysing typical features of collocations in interpreted speeches in this chapter, this study identified the potential influence from interpreters' L1, Chinese. For instance, as noted in Subsection 4.2.2, many recurrent collocations in interpreted speeches have direct translations in Chinese. Moreover, as analysed in Subsection 4.4.2, some unnatural collocations seem to have been coined by trainee interpreters based on Chinese expressions. It is likely that when producing collocations, trainee interpreters are influenced by Chinese expressions, either in their mental lexicon or in Chinese source speeches. To understand how the source language may have influenced the use of collocations in interpreting, this study analysed interpreting shifts relevant to the occurrence of collocations in interpreted speeches and identified congruent collocations in interpreted speeches, which will be presented in the next chapter.

# Chapter Five. Congruent Collocations and Interpreting Shifts

As is reviewed in Section 2.4, typical collocation features of interpreted speeches may be relevant to "the constraints under which the interpreting task is carried out" (Dayter, 2020; Ferraresi & Miličević, 2017, p. 25). This study evaluated whether collocations produced by trainee interpreters were congruent collocations, and analysed interpreting shifts accompanying the occurrence of collocations in interpreted speeches. As noted in Section 3.4, congruent collocations are those having natural word-for-word Chinese translations that convey the intended meaning of the interpreter. Interpreting shifts are semantic and/or syntactic similarities and differences between word-for-word Chinese translations of collocations in interpreted speeches and the correspondence of the collocations in source speeches. Following the methods outlined in Section 3.4, the researcher identified congruent collocations from interpreted speeches and five types of interpreting shifts, namely, transcoding, addition, approximation, compression, and restructuring, which will be further analysed in this chapter.

This chapter includes four sections. In Section 5.1, the proportion of congruent collocations (natural and unnatural) in CIS is presented, followed by interpreting shifts accompanying the occurrence of collocations in Section 5.2. Then the relations between interpreting shifts and the frequency, diversity, and complexity of collocations are clarified in Section 5.3. In section 5.4, interpreting shifts and their relevance to the occurrence of unnatural collocations in CIS are analysed. Section 5.5 summarises the content of this chapter.

## 5.1 Congruent collocations

### 5.1.1 Congruency and natural collocations in interpreted speeches

Among the 2688 collocations extracted from CIS, 1469 (54.65%) are congruent collocations that can be translated word for word into natural Chinese expressions. These congruent collocations reflect the possible influence of the source language, Chinese, on trainee interpreters' use of collocations in interpreted speeches. Among these congruent collocations, 993 (67.60%) do not have word-for-word translations in Chinese source speeches, thus reflecting the interference from interpreters' Chinese mental lexicon. The rest 476 (32.4%) were rendered word-for-word from expressions in source speeches, indicating that the use of collocations in interpreted speeches is under the collective interference from the source speeches and interpreters' Chinese mental lexicon.

The comparison of collocations with different grammatical structures shows that A+N (80.06%), ADV+ADJ (98.39%), N+N (90.32%), N+V (89.09%) and V+N (73.31%) collocations comprise large proportions of congruent collocations (see Table 5.1).

| **Type** | **Congruent collocations** | **Total** | **Proportion** |
|---|---|---|---|
| A+N | 574 | 717 | 80.06% |
| ADV+ADJ | 244 | 248 | 98.39% |
| N+N | 252 | 279 | 90.32% |
| N+V | 49 | 55 | 89.09% |
| V+ADV | 31 | 73 | 42.47% |
| V+N | 195 | 266 | 73.31% |
| ADJ+PREP | 0 | 94 | 0.00% |
| N+PREP | 0 | 205 | 0.00% |
| PREP+N | 19 | 130 | 14.62% |
| V+PREP | 105 | 621 | 16.91% |
| Total | 1469 | 2688 | 54.65% |

Table 5.1 Proportion of congruent collocations with different grammatical structures

Interpreters' use of these five types of collocations seems to have been interfered with by Chinese expressions, both in interpreted speeches and in interpreters' mental lexicon. Interestingly, compared with these five types of collocations, which are all lexical collocations, grammatical collocations in interpreted speeches, such as ADJ+PREP, N+PREP, PREP+N and V+PREP collocations do not include many congruent collocations. This may be due to the typological difference between Chinese and English, as prepositions are not as frequently used as they are in English. As a result, interpreters did not produce many congruent collocations when using these grammatical collocations.

### 5.1.2 Congruency and unnatural collocations in interpreted speeches

The analysis of the 128 unnatural collocations reveals that 54 of them (42.19%) are congruent collocations that have word-for-word correspondences in Chinese. Among these congruent collocations, 15 (27.78%) were copied from source speeches, whereas 39 (72.22%) were not. The

non-source speech congruent collocations indicate that in addition to the source speeches, interpreters may have also been interfered with by their Chinese mental lexicon thus, producing unnatural collocations.

Among the five types of features of unnatural collocations, the feature of missing components largely results from the interference of the source language, as 6 out of 6 unnatural collocations (100%) of this feature are congruent collocations (see Table 5.2). Interpreters either rendered *arrive the airport* and *arrive the destination* word for word from source speech expressions *到达* (arrive, V) *机场* (airport, N) and *到达* (arrive, V) *目的地* (destination, N), or produced *in past* and *care your friends* that seem to have been copied from Chinese expressions *在* (in, PREP) *过去* (past, N), *关心* (care, V) *你的* (your, possessive pronoun) *朋友* (friend, N).

| Features | Congruent collocations | Unnatural collocations | Proportion |
|---|---|---|---|
| Collocation coinage | 15 | 32 | 46.88% |
| Misusing semantically related words | 23 | 65 | 35.38% |
| Missing components | 6 | 6 | 100.00% |
| Component redundancy | 9 | 23 | 39.13% |
| Component inversion | 1 | 2 | 50.00% |
| Total | 54 | 128 | 42.19% |

Table 5.2 Proportion of congruent unnatural collocations

In addition to missing components, many unnatural collocations featuring component inversion (50.00%), collocation coinage (46.88%) and component redundancy (39.13%) were produced under the interference of the source language. Interpreters copied Chinese collocations into interpreted speeches, either from source speeches or from their mental lexicon, which led to the production of unnatural collocations of these features, such as *love* (爱情, N) *world* (世界, N), *message* (信, N) *angel* (使, N), and *career* (职业, N) *life* (生涯, N).

In addition to congruent collocations, interpreting shifts in CIS reflect the possible influence of

the source language, and additionally, the limited capacity of interpreters' working memory on their use of collocations in interpreted speeches. Findings of interpreting shifts are presented in the next section.

### 5.2 Interpreting shifts in CIS

Five types of interpreting shifts were identified in CIS, namely, transcoding, addition, approximation, restructuring, and compression (Table 5.3, Figure 5.1). Through an comparison of the word-for-word translations of all natural and unnatural collocations in interpreted speeches and the source speeches, this study discovers that trainee interpreters transcoded collocations word for word from source speeches, added extra collocations, approximated meanings of source speech expressions with collocations, restructured source speech expressions with collocations, and compressed sentence segments or sentences in source speeches into collocations. Of the five types of shifts, addition occurs most frequently in the interpreting corpus, accounting for 31.39% of all types. Following addition, restructuring (20.21%), transcoding (20.60%), and approximation (20.49%) have also been observed frequently. Compared with the other four types of shifts, compression occurs less frequently in the interpreting corpus, accounting for 7.32% of all types of shifts. In the following subsections, these five types of interpreting shifts in CIS will be analysed with illustrations of examples.

| **Types of shifts** | **Raw frequency** | **Proportion** |
|---|---|---|
| Addition | 884 | 31.39% |
| Restructure | 569 | 20.21% |
| Transcoding | 580 | 20.60% |
| Approximation | 577 | 20.49% |
| Compression | 206 | 7.32% |
| Total | 2816 | 100% |

Table 5.3 The raw frequency and proportion of interpreting shifts in CIS

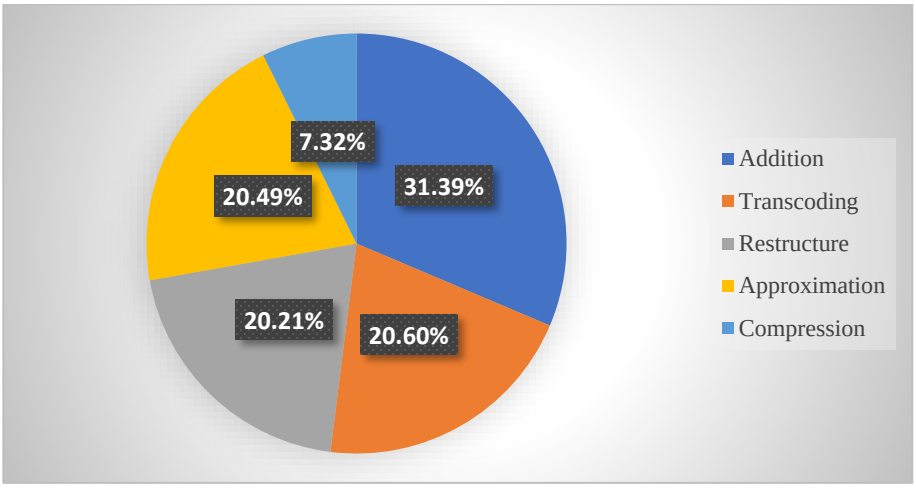



Figure 5.1 Proportions of interpreting shifts

### 5.2.1 Addition

The Chinese literal (word-for-word) translation of 31.39% of collocations in target speeches did not have corresponding source speeches, meaning that these unnatural collocations were added by interpreters. This type of shift is named addition. Addition has been investigated by previous studies under the name of explicitation (Gumul, 2020) and complementation (Wang, 2012). In this study, addition occurs at both the semantic and structural level, as it changes the meaning and syntactic structure of source speeches.

The following example illustrates the shift of addition in CIS:

Example (31)

Source speech (SS):

我们　知道　以前啊　大部分　走的　就是　这种　传统　媒体

Phonemic transcription by morphemes (italicised hereinafter):

*wǒmen　zhīdào　yǐqiána　dàbùfen　zǒude　jiùshì　zhèzhǒng　chuántǒng　méitǐ*

Morphemic breakdown (MB):

We　know　before　most　followed　is　such　traditional　media

比如说　平面　广告，　以及　这种　报纸　之类的　广告。

*Bǐrúshuō　píngmiàn　guǎnggào,　yǐjí　zhèzhǒng　bàozhǐ　zhīlèide　guǎnggào.*

such-as　print　ads　and　such　newspaper　kind of　ads.

Gloss translation (GT):

We know that in the past, (Shuimo town) primarily used traditional media, such as print

advertisements and newspapers, (to promote tourism).

Interpreted speech (IS):

And in the past several years the marketing strategies of Shuimo town is= er was actually *quite simple* and we used a lot of print ads.

(Interpreter 79)

In this example, the interpreter added the collocation *quite simple* in the interpreted speech, which was not expressed by the speakers in the source speech. This addition reinforces the speaker's attitude towards traditional media, enhancing the semantic explicitness of target speech production. Notably, the addition shift is accompanied by the loss of source information in interpreted speeches: the information on traditional media and newspapers in the source sentence was absent in the target sentence. It seems that trainee interpreters have forgotten part of the information in the source speech when producing the target sentence. By adding the collocation *quite simple*, the trainee interpreter compensated for the information loss in the interpreting process. This tendency to compensate for the information loss in consecutive interpreting by adding expressions in interpreted speeches corroborate Tang and Li's (2017) findings of explicitation. The potential factors underpinning the addition shift will be further elaborated in Chapter Six.

### 5.2.2 Transcoding

Transcoding refers to the word-for-word correspondence between the Chinese translated text of collocations and source speeches. When transcoding occurs, both the syntactic structure of source speech expressions and the meaning of each word in the source speech expressions do not change in target speeches. As He (2019, p.37) notes, transcoding occurs when a target language structure is constructed following the same or similar syntactic structure of the source speech.

In the following example, the trainee interpreter transcoded an ADV+ADJ expression in the source sentence and reproduced the ADV+ADJ structure in target speech production.

Example (32)

| | | | | | | |
|---|---|---|---|---|---|---|
| SS: | 从 | 西方 | 又要 | 谈到 | 东方的 | 广场, |
| | *cóng* | *xīfāng* | *yòuyào* | *tándào* | *dōngfāngde* | *guǎngchǎng,* |
| | From | West | again | talk | Eastern | square, |
| | 是 | *很* | *难的* | 问题 | 没有 | 错, |

*shì* *hěn nánde* *wèntí* *méiyǒu* *cuò,*

is *very hard* problem not wrong,

而且 是 很 深的 问题。

*érqiě* *shì* *hěn* *shēnde* *wèntí.*

and is very deep question.

GT: I have to switch the topic from squares in Eastern countries to those in Western countries. Y's, it's a *very difficult* topic. And it's quite a complicated topic.

IS: It's a *very hard* question because I have to talk about the western squares= er from western squares to eastern squares and I think it's a really difficult and deep question.

(Interpreter 71)

In this example, the ADV+ADJ expression *很* (hěn, ADV) *难的* (nánde, ADJ) (very hard) in the source sentence has a word-for-word translation in English. The interpreter followed the word order of the source speech and transcoded the Chinese ADV+ADJ expression *很 难的* (hěn nánde, very hard) into an English ADV+ADJ collocation *very hard*.

### 5.2.3 Approximation

Approximation refers to situations where interpreters paraphrased or used an approximate translation to convey the meaning of a source expression. Approximated collocations in target speeches carry the same syntactic structure as the collocations in source speeches but with different meanings.

In the following example, the collocation in the target speech approximated a source expression:

Example (33)

SS: 王者荣耀 可以 有 如此 大的 用户 体量，

*Wángzhěróngyào* *kěyǐ* *yǒu* *rúcǐ* *dàde* *yònghù* *tǐliàng,*

Glory-of-King can have such big user volume,

整体的 运营 推广 *功不可没*。

*zhěngtǐde* *yùnyíng* *tuīguǎng* *gōngbùkěmò.*

entire operation promotion *credit can't erase*.

GT: The operation and promotion of Glory of King *deserve all the credit* to attract such a

large volume of players.

IS: So I believe today Kings of Glory has such a big number of users can really= er is really *a good work* of its team.

(Interpreter 43)

In this example, the four-character expression in the source speech *功 不可 没* (gong bùkě mò, deserves all the credit) is a Chinese idiom that does not have a direct translation in English. To render it into English, the trainee interpreter needed to deverbalize the source speech expression and use the target language to explain the concept embedded in *功 不可 没* (gong bùkě mò, deserves all the credit). However, compared with conveying the exact meaning of *功 不可 没* (gong bùkě mò, deserves all the credit) in English, the trainee interpreter produced an ADJ+N collocation with an approximate meaning of the source speech expression. The repetition and filled pause occurring before *a good work* suggest that the trainee interpreter may have encountered difficulties in finding a target language expression for *功 不可 没* (gong bùkě mò, deserves all the credit).

### 5.2.4 Restructuring

Restructuring occurs when Chinese translations of collocations differ in syntax (including word order and parts of speech) but are the same in meaning as the Chinese source speeches. Restructuring differs from addition and approximation in that when restructuring occurs, the overall meaning of the source speech does not change.

In the following example, the trainee interpreter adjusted the word order and part of speech of the source speech expression in the target sentence.

Example (34)

| SS: 其实 | 本地化 | 这个 | 东西 | 大家 | 到 | 现在 | 为止 |
|---|---|---|---|---|---|---|---|
| *qíshí* | *běndìhuà* | *zhègè* | *dōngxi* | *dàjiā* | *dào* | *ànzài* | *wéizhǐ* |
| Actually | localization | this | thing | everyone | till | now | up-to |

*对 它 都还 有 一些 误解*。

*duì tā dōuhái yǒu yīxiē wùjiě*.

*about it still have some misconception*.

GT: Actually, localization, some of you till now *still have some misconception about it.*

IS’ Er I'd say there are some erm *misconception about* the localization.

(Interpreter 1)

In the source speech, the Chinese preposition *对* (duì, about) is positioned before the pronoun *它* (tā, it), followed by a V+Determiner+N expression *有 一些 误解* (yǒu yīxiē wùjiě, have some misconception). Suppose the trainee interpreter followed the word order of the source speech sentence segment *对 它 都还 有 一些 误解* (duì tā dōuhái yǒu yīxiē wùjiě, still have some misconception about it) and rendered it word for word into English. In that case, the interpreted speech will be grammatically inappropriate. As shown in the target sentence, the trainee interpreter moved the V+ADJ+N collocation before the preposition *about* to formulate a grammatically correct target sentence. As a result of the restructuring, the N+PREP collocation *misconception about* was produced.

In another example, the trainee interpreter adjusted the part of speech of the source speech expression with a collocation.

Example (35)

| | | | | | | |
|---|---|---|---|---|---|---|
| SS: 所以 | 对于 | 旅游 | 业 | 来 | 说， | |
| *suǒyǐ* | *duìyú* | *lǚyóu* | *yè* | *lái* | *shuō,* | |
| So | for | tourism | industry | to | say, | |
| *最 | 重要的* | 还 | 是 | 游客的 | 一个 | 体验。 |
| *zuì | zhòngyàode* | *hái* | *shì* | *yóukède* | *yīgè* | *tǐyàn.* |
| *most important* | | still | is | tourists’ | a | experience. |

GT: So for tourism, *the most important* is the customer experience.

IS: And we think that the customer experience is *of the greatest importance* in promoting the tourism development.

(Interpreter 74)

In Example (35), the ADV+ADJ expression in the source speech, *最* (ADV) *重要的* (ADJ) (zuì zhòngyàode, the most important), was rendered into the ADJ+N English collocation *(of the) greatest importance.* This collocation was constructed based on lexical items deriving from the same root of words in source speech expressions, and the meaning of the source speech expression *最 重要的* (zuì zhòngyàode, the most important) did not change in the interpreting process.

### 5.2.5 Compression

Compression describes situations where the structure and meaning of the source speech are both simplified in the target speech. In the following example, an interpreter compressed a sentence segment into a collocation:

Example (36)

SS: …白天的 时候, 它 优雅地,

*...báitiānde shíhou, tā yōuyǎde,*

…daytime's time, it elegantly,

它 *优雅地 矗立 在 整个 教堂的 呃 草地 上面*。

*tā yōuyǎde chùlì zài zhěnggè jiàotángde è cǎodì shàngmiàn.*

it *elegantly stands on entire cathedral's er lawn above.*

GT: … in the daytime, *it (the pattern of the wedding dress) stands gracefully on the lawn of the Cathedral.*

IS: …in the day there were just dresses *standing there.*

(Interpreter 15)

In Example (36), the interpreter deleted the information *优雅地* (yōuyǎde, gracefully) and *整个 教堂的 呃 草地 上面* (zhěnggè jiàotángde è cǎodì shàngmiàn, the lawn of the Church) in the source sentence *优雅的 矗立在 整个 教堂的 呃 草地 上面* (yōuyǎde chùlì zài zhěnggè jiàotángde è cǎodì shàngmiàn, it stands gracefully on the lawn of the Cathedral) and compressed the sentence into a V+ADV collocation *stand there* in the interpreted speech. In this example, the meaning and structure of the source speech sentence have changed. The use of the V+ADV collocation *stand there* compensates for the information loss in the interpreting process.

## 5.3 Interpreting shifts and typical collocation features of interpreted speeches

As Chapter Four reveals, interpreted speeches demonstrate typical collocation features that distinguish them from L1 English speeches. Specifically, five types of collocations were produced more frequently by trainee interpreters, whereas the other five types occur less frequently in the interpreting corpus. Trainee interpreters used two types of collocations significantly less diversely and six types of collocations in a less complex manner than L1

English speakers. In addition, trainee interpreters produced unnatural collocations. To further unveil how these typical collocation features of interpreted speeches are relevant to the interpreting process, this section analyses interpreting shifts accompanying the occurrence of the ten types of natural and unnatural collocations in interpreted speeches.

### 5.3.1 Interpreting shifts and the frequency of collocations

As presented in Subsection 4.1.2, like other L2 English learners, trainee interpreters produced ADJ+N, N+V, V+ADV, V+N, and V+PREP collocations less frequently than L1 English speakers. However, for ADV+ADJ, N+N, ADJ+PREP, PREP+N, and N+PREP collocations, trainee interpreters outperform L1 English speakers in the frequency of collocations. To understand factors relevant to the number of collocations trainee interpreters produced, the researcher calculated the proportion of interpreting shifts accompanying the ten types of collocations (Table 5.4, Figure 5.2).

| Type | Addition | Approximation | Restructuring | Transcoding | Compression | Total |
|---|---|---|---|---|---|---|
| Underused collocations | | | | | | |
| ADJ+N | 34.87% | 22.32% | 8.65% | 18.83% | 14.50% | 99.17%[20] |
| N+V | 21.82% | 23.64% | 16.36% | 25.45% | 12.73% | 100.00% |
| V+ADV | 34.25% | 24.66% | 16.44% | 6.85% | 17.81% | 100.01% |
| V+N | 33.46% | 16.92% | 20.68% | 13.53% | 15.41% | 100.00% |
| V+PREP | 31.88% | 27.54% | 29.95% | 9.18% | 1.45% | 100.00% |
| Overused collocations | | | | | | |
| N+N | 25.81% | 15.77% | 0.36% | **56.99%** | 0.72% | 99.65% |
| ADV+ADJ | 23.79% | 19.76% | 5.24% | **47.98%** | 3.23% | 100.00% |
| ADJ+PREP | 28.72% | 14.89% | **52.13%** | 0.00% | 4.26% | 100.00% |
| N+PREP | 34.15% | 6.34% | **54.63%** | 0.49% | 4.39% | 100.00% |
| PREP+N | **49.23%** | 6.15% | 38.46% | 3.08% | 3.08% | 100.00% |
| Average | 31.80% | 17.80% | 24.29% | 18.24% | 7.76% | 99.89% |

Table 5.4: Interpreting shifts accompanying the ten types of collocations

[20] Percentages don't always add up to exactly 100%. This is an expected result of rounding to the nearest whole number. For example, three equal responses would give percentages of 33.3% each. When rounded to whole numbers we get 33%, 33% and 33% that together make only 99%.

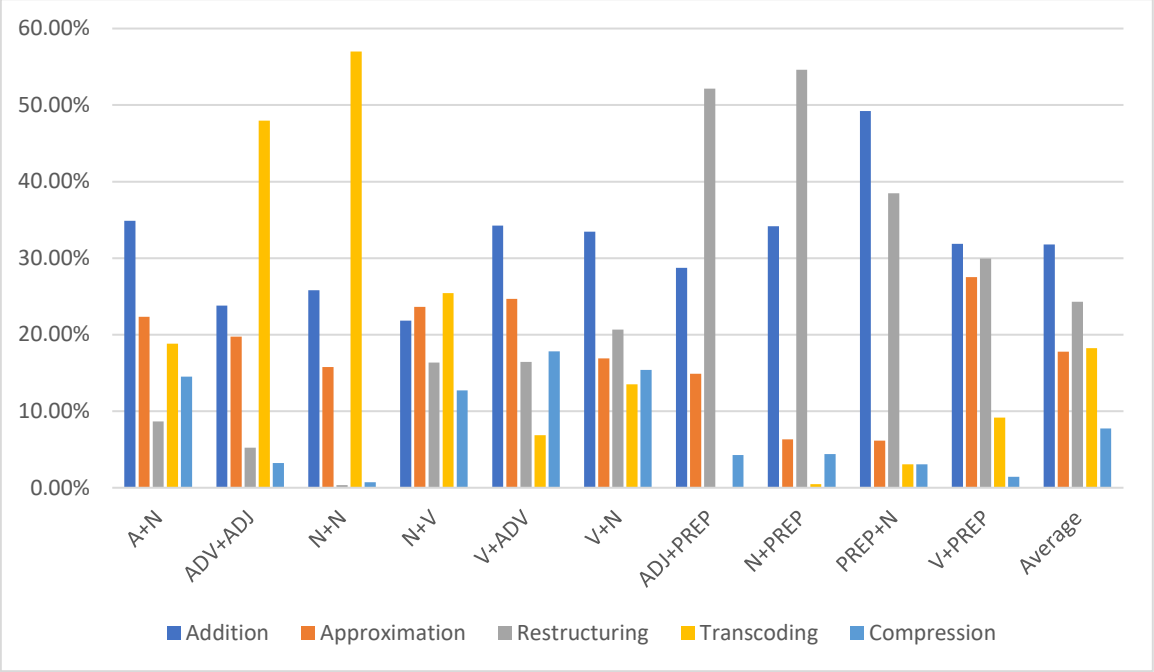



Figure 5.2 Interpreting shifts accompanying the ten types of collocations

Upon analysing the distribution of the five interpreting shifts across the ten types of collocations in interpreted speeches, it becomes evident that the occurrence of approximately half of the overused collocations, as indicated by the bold fonts, is accompanied by shifts of transcoding, restructuring or addition. In comparison, the proportion of shifts accompanying the other five types of underused collocations is more evenly distributed. The discrepancy indicates that the overuse and underuse of collocations in interpreted speeches may be relevant to the interpreting process, which necessitates linguistic shifts. In comparison, L1 English speakers do not need to make those shifts. As a result, trainee interpreters may produce those types of collocations more frequently than L1 English speakers.

For instance, a large proportion of ADV+ADJ and N+N collocations in the interpreted speeches were direct transcoding from the source speeches, with proportions of 47.89% and 56.99% respectively. These percentages are larger than the percentages of underused collocations that were transcoded from source speeches, i.e., ADJ+N (18.83%), N+V (25.45%), V+ADV (6.85%) and V+N (13.53%), V+PREP (9.18%). The frequent transcoding of ADV+ADJ and N+N expressions from source speeches may explain their overrepresentation in interpreted speeches. Essentially, the frequent direct conversion of these two types of collocations from the source

speeches could inflate their occurrence in the interpreted speeches, contributing to the more frequent occurrence in interpreted speeches than in L1 English speeches.

Then, the question comes why ADV+ADJ and N+N collocations, rather than the other types of collocations, were frequently transcoded from source speeches. As Biber et al. (1999) note, the discourse role of N+N structures is to establish reference and provide information on entities, and ADV+ADJ structures are mainly used to express speakers' attitudes and stances (Biber et al., 2004). In comparison, collocations comprised of verbs, such as N+V collocations, are central to the global structures of sentences and are mainly used for sentence construction (M. Baker, 2003). The higher proportion of transcoded collocations with N+N and ADV+ADJ structures in interpreted speeches indicates that trainee interpreters tend to reproduce entities by transcoding N+N collocations in source speeches, such as *芭蕾* (ballet, N)*舞者* (dancer, N), *乳腺* (breast, N) *癌* (cancer, N), *市* (city, N) *中心* (center, N) and convey the attitude denoted by speakers in the source speech by reproducing the surface structure of ADV+ADJ expressions in source speeches, such as *很* (quite, ADV) *舒服* (comfortable, ADJ), *很* (quite, ADV) *难* (comfortable, ADJ), *很* (quite, ADV) *好* (good, ADJ). Compared with the other types of collocations, N+N and ADV+ADJ collocations seem more informative. Therefore, transcoding N+N and ADV+ADJ collocations is more efficient than reproducing the other types of collocations, which enables interpreters to reproduce the message of source speeches as much as possible.

In the following example, the trainee interpreter transcoded the ADV+ADJ structure but discarded the V+ADJ+N structure in the source speech.

Example (37)

SS: 爱情 对 她 来说 太 重要了,

*àiqíng duì tā láishuō tài zhòngyàole,*

Love to her speaking-of *too important*,

她 根本 就 不 在乎 自己的 地位。

*tā gēnběn jiù bù zàihu zìjǐde dìwèi.*

she all just *don't care herself status*.

GT: Love is too important to her that she doesn't care about her identity at all in the relationship.

IS: Love is *too important* for her that she even decide to er give up her status in the two people relationship.

(Interpreter 28)

The ADV+ADJ structure 太 (ADV)重要了 (ADJ) (tài zhòngyàole, too important) in the source speech was reproduced in the target speech. The interpreter could have restructured 太重要了 (tài zhòngyàole, too important) and rendered it into expressions such as *matters a lot* or *cared much about*. However, the trainee interpreter kept close to the structure of 太重要了 (tài zhòngyàole, too important) and reproduced this structure in the target sentence. In comparison, when rendering the V+ADJ+N structure 不在乎 (V) 自己的 (ADJ)地位 (N) (bù zàihu zìjǐde dìwèi, not care about her identity), the trainee interpreter restructured the source expression and produced *give up her status in the two people relationship*. The expression 不在乎 自己的 地位 (bù zàihu zìjǐde dìwèi, not care about her identity), which means *does not care about her identity in the relationship*, was vague in meaning. It seems that to make the target speech understandable, the trainee interpreter did not stick to the surface structure of the source expression but deverbalised 不在乎 自己的 地位 (bù zàihu zìjǐde dìwèi, not care about her identity) into a concept and expressed the concept by constructing a new structure in the target language.

The possible cognitive reasons for the large proportion of transcoded N+N and ADV+ADJ collocations in interpreted speeches will be further discussed in Chapter Six. In addition to these two types of collocations, the more frequent occurrence of N+PREP and ADJ+PREP collocations in interpreted speeches is largely attributed to the shift of restructuring. As shown in Table 5.4, 52.13% of ADJ+PREP and 54.63% of N+PREP collocations were produced to facilitate the adjustment of the word order or the Part of Speech of source speech expressions. This adjustment occurs when an expression exists only in Chinese but not English. In the following example, the V+…+N structure in the source sentence, 有…的狂热 (has…passion for), was rendered into an ADJ+PREP collocations, *be passionate about*.

Example (38)

| | | | | |
|---|---|---|---|---|
| SS: …他 | 对于 | 建筑 | 对于 | 设计 |
| *…tā* | *duìyú* | *jiànzhù* | *duìyú* | *shèjì* |
| …he | for | architecture | for | design |

*有　一　股　莫名的　一个　狂热*。

*yǒu　yī　gǔ　mòmíngde　yīgè　kuángrè*.

*has　a　surge　inexplicable　a　zeal*.

GT: …he *has some unreasonable passion for* architecture and design.

IS: …he is very *passionate about* architecture and designing.

(Interpreter 7)

In this example, the trainee interpreter adjusted the word order of the source sentence by moving the expression *对于...有狂热* (duìyú … yǒu kuángrè, has passion for) before the nouns *建筑* (jiànzhù, architecture) and *设计* (shèjì, design). If the interpreter followed the word order of the source sentence, the ungrammatical sentence segment *he for architecture for design has a surge inexplicable a zeal*, which is a word for word translation of *他 对于 建筑 对于 设计 有 一 股 莫名的 一个 狂热* (tā duìyú jiànzhù duìyú shèjì yǒu yī gǔ mòmíngde yīgè kuángrè, he has some unreasonable passion for architecture and design) will be produced. In addition to adjusting the word order of the source sentence, the interpreter changed the part of speech of *狂热* (kuángrè, passion) from a noun into an adjective and rendered the preposition *对于* (duìyú, for) into *about* in the target sentence. Consequently, the ADJ+PREP collocation *(be) passionate about* was produced.

Apart from the ADJ+PREP structure, 54.63% of N+PREP collocations in the interpreting corpus were produced as a result of the restructuring of premodifier + noun structures in source speeches. When rendering premodifier + noun structures, trainee interpreters tend to move the modified noun forward and connect the noun with a post-modifier in the interpreted speech. For instance:

Example (39)

SS: 那　这个　回廊　通常　是　*传教士*

*nà*　*zhègè*　*huíláng*　*tōngcháng*　*shì*　*chuánjiàoshì*

So　this　cloister　usually　is　missionary

*居住　与　活动的　场所*…

*jūzhù　yǔ　huódòngde　chǎngsuǒ*...

*live　and　exercise's　place*…

GT: This corridor used to be the place where *missionaries live and have activities*…

IS: Erm you can see in the= this is *the place for* the clustery to live and to have some activities…

(Interpreter 13)

In the source speech, *场所* (chǎngsuǒ, place) was pre-modified by the clause *传教士 居住 与 活动的* (chuánjiàoshì jūzhù yǔ huódòngde, missionaries live and have activities). Rendered into English, the clause *传教士 居住 与 活动的* (chuánjiàoshì jūzhù yǔ huódòngde, missionaries live and have activities) needs to be moved after *场所* (chǎngsuǒ, place) to post-modify the head noun *场所* (chǎngsuǒ, place). The interpretation of pre-modifier+noun structure from Chinese into English has been recognised as cognitively demanding for interpreters (Ma, 2021; Wang & Zou, 2016). Chinese is a typical left-branching language in which long strings of modifiers are frequently positioned before the head nouns, while in English, modifiers can be located after nouns (Ma, 2021; Shlesinger, 2003). As Wang and Zou (2018) and Ma (2019) reveal, interpreting Chinese pre-modifier+noun structure into English requires interpreters to adjust the word order of the source speech structure, which may cost extra attention and increases the cognitive burden of interpreters. Since using collocations helps language users ease the cognitive burden in production (Tavakoli & Uchihara, 2020), when interpreting the pre-modifier+noun expression from Chinese into English, the use of collocations may help interpreters reduce the cognitive load of the word order change. In Example (39), it is likely that the structural asymmetry between the Chinese pre-modified structure and English post-modified structure increased the cognitive load of the trainee interpreter, as manifested by the self-repair *in the= this is* before the N+PREP collocation *the place for*. Then, the trainee interpreter changed the word order and the clause *传教士 居住与 活动的* (chuánjiàoshì jūzhù yǔ huódòngde, missionaries live and have activities) into a prepositional phrase post-modifying the noun *place*. In this process, the use of the N+PREP collocation, *the place for*, may have facilitated the restructuring of the source speech structure and have alleviated the cognitive overload imposed by the structural asymmetry between Chinese and English, making the interpreted speeches conform to the target language's grammatical conventionality. The possible cognitive mechanism of the restructuring shift will be further discussed in the next chapter.

In addition to the four types of collocations analysed above, 49.23% of PREP+N collocations do not have correspondence in source speeches and result from the addition shift. Notably,

interpreters tend to frequently add “discourse organisers” to “reflect the relationship between the prior and coming discourse” and organise the discourse structure (Biber et al., 2004, p.384). Among all PREP+N collocations occurring due to addition, 73.44% are discourse organisers, such as *in order to*, *for example*, *in addition to*, and *in terms of*. In the following example, the trainee interpreter produced the same PREP+N collocation, *in terms of*, twice. However, the second *in terms of* could have been omitted in interpreted speeches.

Example (40)

SS: 啊 因为 我 觉得 这个 世界 真的 非常 非常的 多样。

*ā yīnwèi wǒ juéde zhègè shìjiè zhēnde fēicháng fēichángde duōyàng.*

Ah because I feel this world really very very diverse.

尤其是 如果 回到 国内 的话,

*yóuqíshì rúguǒ huídào guónèi dehuà,*

Especially if return-to China if (hypothetical marker),

你 会 发现 不同的 大城市 也 有 不同 大 城市的 属性,

*nǐ huì fāxiàn bùtóngde dàchéngshì yě yǒu bùtóng dà chéngshìde shǔxìng,*

you will find different big city also have different big city’s properties,

不同的 行业。

*bùtóngde hángyè.*

different industry.

GT: Because I think this world is quite diverse. Particularly, if you return to China, you will find that different big cities also have different characteristics, and different industries.

IS: Because it is a big world. And there are many industries which are very er which are different. And *in terms of* the different cities, they are different *in terms of* different fields. They are different.

(Interpreter 6)

In English, the PREP+N collocation *in terms (of)* marks the transition between topics and signals a focus on a specific topic (Nesi & Basturkmen, 2006). In Example (40), the source speaker used the expression *尤其是* (yóuqíshì, particularly) to narrow the focus from the world's diversity to the diversity of big cities in China. The trainee interpreter rendered the expression *尤其是* (yóuqíshì, particularly), which could have been rendered into a single word, i.e., *particularly*, into the PREP+N collocation *in terms of*. Then, the interpreter added an extra *in terms of* to connect *they are different* and *different fields*. This addition seems to make the target sentence redundant and could have been substituted by the preposition *in*.

A similar tendency of the frequent use of discourse organisers Is observed by Hasselgård (2019) in comparing English four-word lexical bundles produced by Norwegian-speaking English learners and L1 speakers in writing. Similar to trainee interpreters in the present study, Norwegian-speaking English learners tend to repeatedly use discourse organizers such as *on the other hand*, *when it comes to*, and as *we can see*. Hasselgård explains that the frequent use of those discourse organizers can be attributed to the typological difference between Norwegian and English. Because discourse organisers recurrently occur in the L2 products have more "corresponding expressions" in Norwegian than those used more frequently by L1 English users (Hasselgård, 2019, p.15).

However, the structural similarity between Chinese and English PREP+N structures may not account for the frequent addition of PREP+N collocations in interpreted speeches because PREP+N collocations are frequently added by trainee interpreters (e.g. *for example*, *in terms of*, *in order to*), including *in terms of* illustrated in Example (40), and do not have word-for-word correspondence in Chinese. Instead, it seems that by adding certain PREP+N collocations, which might be salient in interpreter'' memory, trainee interpreters compensate for the memory decay or the limited attention capacity in the interpreting process. As shown in Example (40), the repeated use of *in terms of* is accompanied by the information loss of source speeches. It is possible that by using this discourse organiser, the interpreter was buying time to recall the source speech information and filling the gap of the information loss in the interpreting process. The possible mechanism of addition will be further discussed in Chapter Six.

In sum, the more frequent use of the five types of collocations in interpreted speeches seems to be relevant to the interpreting process. A large proportion of N+N and ADV+ADJ collocations were transcoded from source speeches, enabling interpreters to relay the core information of source speeches efficiently. In addition, over half of the ADJ+PREP and N+PREP collocations occurred because the trainee interpreter restructured source expressions. This can be primarily attributed to the structural and grammatical asymmetry between Chinese and English. Given that interpreters are tasked with addressing these linguistic disparities during the interpreting process, while L1 English speakers are not, it seems plausible that this led to a more frequent occurrence of ADJ+PREP and N+PREP collocations in interpreted speeches, as compared with L1 English speeches. Furthermore, it appears that around half of PREP+N collocations were added by interpreters in an attempt to alleviate the cognitive load associated with the interpreting process. This, too, might have contributed to the overuse of PREP+N collocations in interpreting.

### 5.3.2 Interpreting shifts and the diversity of collocations

The significantly less diverse use of N+N and N+PREP collocations in interpreted speeches, as revealed in Section 4.2.2, can also be partially attributed to the interpreting process. To understand how the interpreting shifts may have influenced the diversity of N+N and N+PREP collocations, the researcher checked source speeches of the top ten most recurrent N+N and N+PREP collocations in interpreted speeches. As shown in Table 5.5 and Figure 5.3, 56.17% of recurrent N+N collocations were transcoded from N+N expressions in source speeches, 21.83% occurred as a result of addition, and 22% approximate the meaning of source speech expressions.

| N+N collocations | Addition | Transcoding | Approximation | Restructuring | Compression | Total |
|---|---|---|---|---|---|---|
| Science park | 0 | 100% | 0 | 0 | 0 | 100% |
| Game player | 16.67% | 33.33% | 50% | 0 | 0 | 100% |
| Project manager | 0 | 100% | 0 | 0 | 0 | 100% |
| Pipe organ | 16.67% | 83% | 0 | 0 | 0 | 99.67% |
| Product manager | 20% | 60% | 20% | 0 | 0 | 100% |
| Cell phone | 0 | 100% | 0 | 0 | 0 | 100% |
| Cancer patient | 40% | 60% | 0 | 0 | 0 | 100% |

| | | | | | | |
|---|---|---|---|---|---|---|
| Lung cancer | 75% | 25% | 0 | 0 | 0 | 100% |
| Assembly hall | 0 | 0 | 100% | 0 | 0 | 100% |
| Market share | 50% | 56.17% | 22% | 0 | 0 | 100% |
| Average | 21.83% | 56.17% | 22% | 0 | 0 | 99.96% |

Table 5.5 Interpreting shifts accompanying the top ten most recurrent N+N collocations in CIS

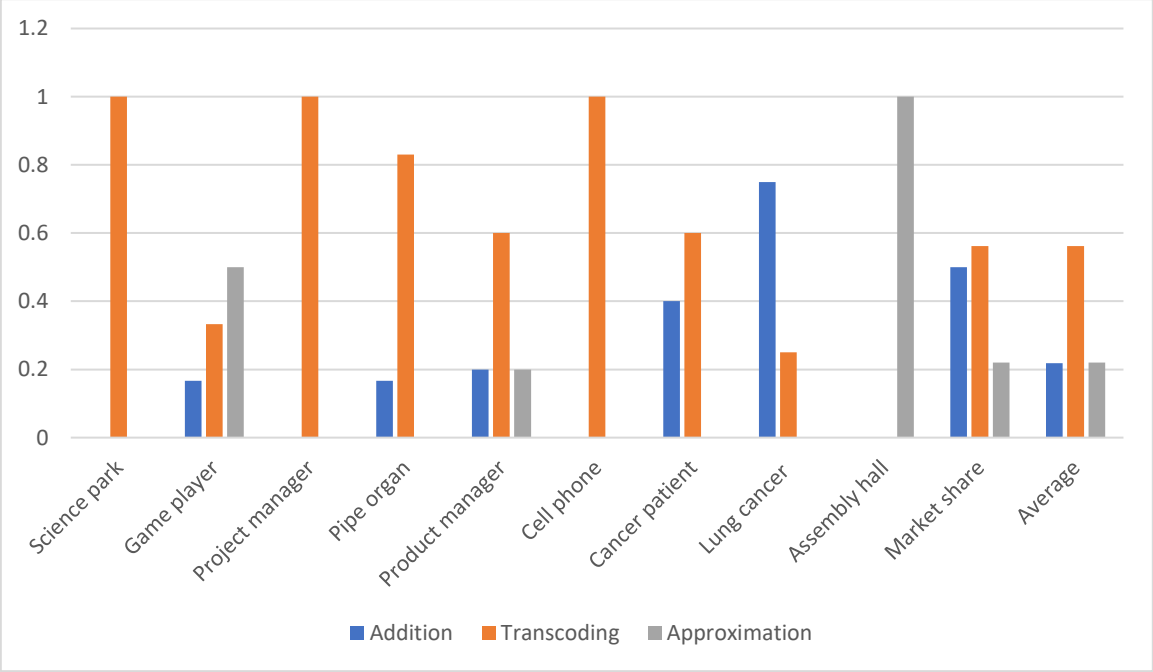



Figure 5.3 Interpreting shifts accompanying the top ten most recurrent N+N collocations in CIS

As shown in Table 5.5, on average 56.17% of the top ten recurrent N+N collocations were transcoded from source speeches. It seems that the frequent transcoding of certain N+N collocations in Chinese source speeches has contributed to the higher degree of collocation repetitiveness of interpreted speeches. For instance, the most recurrent N+N collocation in interpreted speeches, *science park*, were all transcoded from source speeches. In Subsection 4.2.2, it was assumed that the repeated use of *science park* may be because interpreters are familiar with this collocation and used it to avoid making mistakes. However, an examination of source speeches shows that the frequent use of *science park* can be largely due to the fact that the Chinese expression *科技园* (kējì yuán, science park) recurs in source speeches, and interpreters transcoded it frequently from source speeches into the target language collocation *science park*. In addition, the frequent transcode of *科技园* (kējì yuan, science park) may also be attributed to

the influence of the topic of the source speech. Because *科技园* (kējì yuan, science park) is highly relevant to the topic of the speech: Cambridge Science Park. Therefore, the expressions *科技园* (kējì yuan, science park) may be salient for trainee interpreters and, hence, have been frequently transcoded.

Apart from transcoding N+N collocations from source speeches, trainee interpreters also repeatedly use certain N+N collocations in interpreted speeches to approximate the meaning of source speech expressions or to explicitate the meaning of source speech expressions. For instance, the collocation *market share* occurs four times in interpreted speeches, among which two result from the shift of addition and the other two from approximation. The following example illustrates how the trainee interpreter used the N+N collocation *market share* to explicitate the meaning of source speech:

Example (41)

SS: 但是 更多的呢 我们 Wegame 是 希望

*dànshì gèngduōdene wǒmen WeGame shì xīwàng*

But more we WeGame is hope

填补 steam 在 中国的 一些 空白。

*tiánbǔ Steam zài Zhōngguóde yīxiē kòngbái.*

fill Steam in China's some gap.

GT: But more importantly, we hope Wegame can fill in some of the gaps that Steam has in China.

IS: But more= we will focus more on completing the= completing the ***market share*** of steam in China.

(Interpreter 41)

In this example, the speaker does not clarify the meaning of *空白* (kòngbái, gap) in the source speech, which makes the meaning of the source speech sentence vague. It seems that the

interpreter recognised this semantic vagueness and used the collocation *market share* to explicitate the meaning of *空白* (kòngbái, gap). It remains unknown whether the speaker was referring to *market share*. However, by adding this collocation, the interpreter seems to be attempting to facilitate the understanding of target audiences.

Notably, in another case, the same interpreter used the collocation *market share* to approximate the meaning of a source speech expression:

Example (42)

| | | | | | |
|---|---|---|---|---|---|
| SS: 腾讯 | 游戏 | 网络 | 游戏 | 2016 | 年 |
| *téngxùn* | *yóuxì* | *wǎngluò* | *yóuxì* | *èrlíngyīliù* | *nián* |
| Tencent | Game | online | games | 2016 | year |
| *总 收入* | | 708.44 | | 亿 | 元。 |
| *zǒng shōurù* | | *qībǎilíngbādiǎnsìsì* | | *yì* | *yuán.* |
| *total revenue* | | 708.44 | | billion | yuan. |

GT: The total revenue of Tencent's online gaming was 70.844 billion yuan in 2016.

IS: In 2016, our *market share* was seventy= seventy billion R M B.

(Interpreter 41)

In this example, the expression *总* (ADJ) *收入* (N) (zǒng shōurù, total revenue) in the source speech was rendered into *market share* by the interpreter, which semantically deviates from the meaning of the source speech expression. It is possible that the interpreter has forgotten the source speech expression *总 收入* (zǒng shōurù, total revenue) when producing the interpreted speech and to compensate for the information loss, produced the collocation *market share*. Another possibility is that the interpreter did not have a target language equivalence of *总 收入* (zǒng shōurù, total revenue) stored in the mental lexicon. By using the collocation *market share*, which seems to be more familiar to the interpreter and is semantically relevant to *总 收入* (zǒng shōurù, total revenue), the interpreter can avoid the risks of failing to produce the interpreted

speech. Examples (41) and (42) reflect what previous studies note as the risk-avoidance tendency in interpreting (Ferraresi et al., 2019; Lv & Jiang, 2019). By repeatedly using certain collocations, such as *market share* in examples (41) and (42), interpreters may avoid risks brought by the cognitively demanding nature of consecutive interpreting. Consequently, interpreted speeches may feature a higher degree of collocation repetitiveness than speeches in the same language.

In addition to N+N collocations, the less diverse occurrence of N+PREP collocations in interpreted speeches may also be associated with the interpreting process. Table 5.6 and Figure 5.4 show that 52.53% top ten recurring N+PREP collocations were produced because interpreters restructured the source speech expressions. That indicates that the structural and grammatical differences between Chinese and English, which promotes the restructuring shift, may have contributed to the repeated production of N+PREP collocations in interpreted speeches.

| N+PREP collocations | Addition | Transcoding | Approximation | Restructuring | Compression | Total |
|---|---|---|---|---|---|---|
| relationship between | 22.22% | 0 | 0 | 66.67% | 11.11% | 100% |
| place for | 37.50% | 0 | 0 | 62.50% | 0 | 100% |
| information about | 42.86% | 0 | 0 | 57.14% | 0 | 100% |
| knowledge about | 20.00% | 0 | 0 | 60.00% | 20.00% | 100% |
| plan for | 0 | 0 | 0 | 100% | 0 | 100% |
| differences between | 20.00% | 0 | 0 | 80.00% | 0 | 100% |
| network for | 33.33% | 0 | 33.33% | 0 | 33.33% | 99.99% |
| in accordance with | 50.00% | 0 | 0 | 50.00% | 0 | 100% |
| story about | 50.00% | 0 | 0 | 50.00% | 0 | 100% |
| speech about | 50.00% | 50% | 0 | 66.67% | 11.11% | 100% |
| Average | 32.59% | 5.00% | 3.33% | 52.63% | 6.44% | 100% |

Table 5.6 Interpreting shifts accompanying the top ten most recurrent N+PREP collocations in CIS

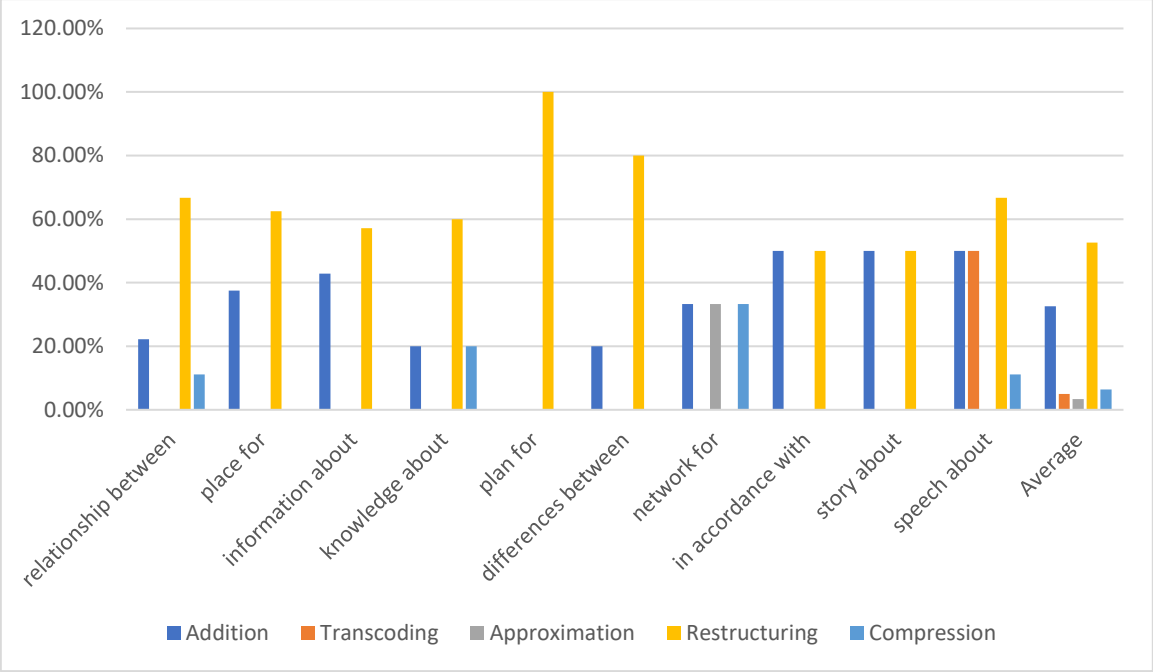



Figure 5.4 Interpreting shifts accompanying the top ten most recurrent N+PREP collocations

For instance, trainee interpreters repeatedly used *the relationship between* to restructure the *与/跟+…+的+关系* (with something/someone's relationship) in source speeches:

Example (43)

SS: 建筑 *与* 舞蹈 *的 关系*

*jiànzhù* *yǔ* *wǔdǎo* *de guānxì*

architecture *and* dance *'s relationship*

GT: architecture *and* dance*'s relationship*

IS: *the relationship between* architecture and dance

(Interpreter 50, Interpreter 51)

Example (44)

SS: 空间 *与* 建筑 *的* 一个 *关系*

*Kōngjiān* *yǔ* *jiànzhù* *de* *yīgè* *guānxì*

Space *and* architecture *'s* *a* *relationship*

GT: space *and* architecture's *relationship*

IS: er *the relationship between* 3D design and architecture

(Interpreter 55)

Example (45)

SS: 披萨 *跟* 都市 社区 到底

*pīsà* *gēn* *dūshì* *shèqū* *dàodǐ*

Pizza *with* urban community ultimately

有 什么样 的 *关系*呢？

*yǒu* *shénmeyang* *de* *guānxì*ne?

have what kind-of *relationship*?

GT: What is *the relationship between* pizza and urban communities?

IS: So what is *the relationship between* pizza and urban design?

(Interpreter 68)

In the three examples, the collocation *the relationship between* is regarded as the equivalence to the Chinese expression *跟...的 关系* (gēn… de guānxì, the relationship between ) and therefore was used widely by trainee interpreters. Four interpreters rendered the preposition + … + relationship *与/跟...的 关系* (gēn… de guānxì, the relationship between ) into *the relationship with*, which increases the repetitiveness of collocations in the interpreting corpus. In this regard, the recurrence of the Chinese expression *与...的 关系* (gēn… de guānxì, the relationship between) may have contributed to the recurrence of its English equivalent, *the relationship between*, in interpreted speeches.

### 5.3.3 Interpreting shifts and the complexity of collocations

As uncovered in Subsection 4.3.2, interpreted speeches include a significantly lower proportion of strongly associated ADJ+N, V+PREP, ADV+ADJ, and N+N collocations and a significantly larger proportion of common V+ADV and ADV+ADJ collocations than L1 English speeches. To understand if the more abundant use of common collocations and the less frequent use of strongly associated collocations are relevant to the interpreting process, the researcher examined interpreting shifts accompanying the occurrence of strongly associated ADJ+N, V+PREP, ADV+ADJ and N+N collocations and common V+ADV and ADV+ADJ collocations in interpreted speeches.

As shown in Table 5.7 and Figure 5.5, a large proportion of strongly associated N+N (63.53%) and ADV+ADJ (55.17%) collocations were transcoded from source speeches. Most of these transcoded collocations are proper names, terms, and specialised or technical collocations, such as *manufacturing sector*, *metro station*, *escape velocity*, *ballet dancer*, *environmentally friendly*, which are favoured by high MI scores (Gablasova et al., 2017). N+N collocations and ADV+ADJ collocations in interpreted speeches include less strongly associated collocations that are technical terms than those in L1 English speeches. One possibility of such a result is that L1 English speakers in this study are all experts in their fields and may have a broader knowledge of terminologies and proper names stored in their mental lexicon. Consequently, more terms and proper names are produced in L1 English speeches, increasing collocation complexity. In addition, as noted in Subsection 3.2.1, source speeches in the Chinese-to-English consecutive interpreting were not highly technical and were delivered to non-expert target audiences at the mock conference. Therefore, it is likely that source speeches do not include as many technical terms and proper names as L1 English speeches do, which further influenced the number of technical terms and proper names in interpreted speeches.

| | Addition | Approximation | Restructuring | Transcoding | Compression | Total |
|---|---|---|---|---|---|---|
| N+N | 22.35% | 14.12% | 0.00% | 63.53% | 0.00% | 100% |
| ADV+ADJ | 27.59% | 6.90% | 3.45% | 55.17% | 6.90% | 100.01% |
| V+PREP | 38.46% | 23.08% | 15.38% | 23.08% | 0.00% | 100% |
| ADJ+N | 30.00% | 27.22% | 13.89% | 21.67% | 7.22% | 100% |
| Average | 29.60% | 17.83% | 8.18% | 40.86% | 3.53% | 100% |

Table 5.7 Interpreting shifts accompanying strongly associated collocations in CIS

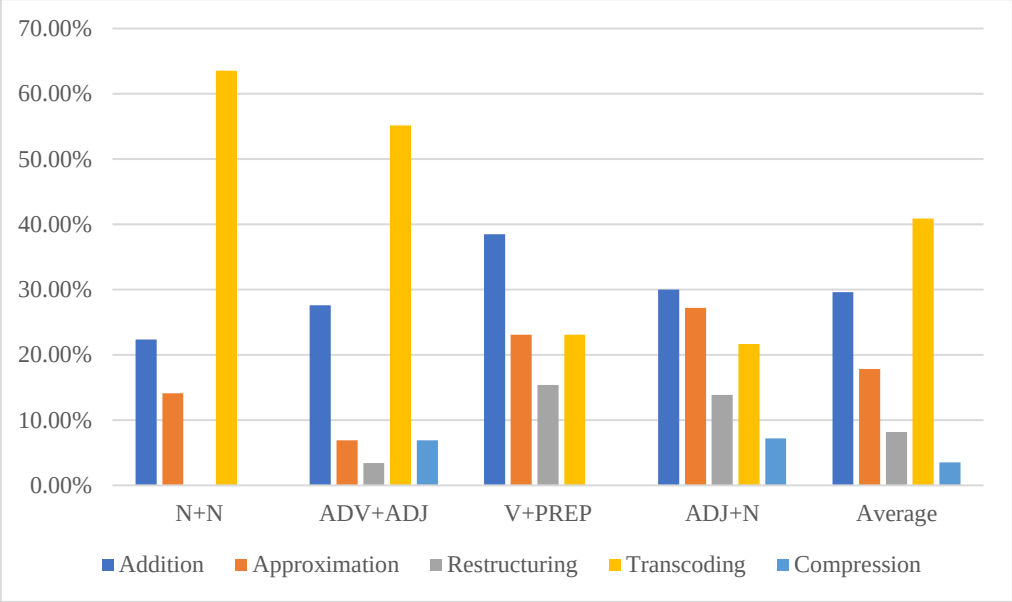



Figure 5.5 Interpreting shifts accompanying strongly associated collocations in CIS

In addition to the shift of transcoding, addition and approximation also play important roles in the occurrences of strongly associated N+N, ADV+ADJ, V+PREP, and ADJ+N collocations. Using strongly associated collocations that are relevant to the context of the source sentence seems to have helped interpreters compensate for the memory decay in the interpreting process, as shown in the following example.

Example (46)

SS: 现在的 水墨 镇 大家 都 说

*xiànzàide shuǐmò zhèn dàjiā dōu shuō*

Now Shuimo town everyone all say

宜 居 休闲 环境 好,

*yí jū xiūxián huánjìng hǎo,*

suitable living leisure environment good,

是 成都的 后花园，

*shì chéngdūde hòuhuāyuán,*

is Chengdu's backyard,

早 已 看不见 当初 那个 工 工业镇 的 影子。

*zǎo yǐ kànbùjiàn dāngchū nàgè gōng gōngyè zhènde yǐngzi.*

long since cannot-see originally that ind industrial town's shadow.

GT: Now, everyone says that the Shuimuo town is suitable for living and is with a good environment. It is the backyard of Chengdu. The traces of the initial industrial town are no longer recognisable.

IS: Now the Shimuo town has become a place that is appropriate for people's living. Er we are also very great in ***environmental protection***. Er we are no longer an area that is damaged by the industrial development.

(Interpreter 78)

In this example, the interpreter seems to have forgotten the information of *是成都的后花园* (shì chéngdūde hòuhuāyuán, is the backyard of Chengdu) or did not know how to convey this information in the target language. By using the strongly associated collocation *environmental protection*, the interpreter filled the gap of the information loss, and may have gained the interpreter some time to recall other information in the source speech.

Given that a certain number of strongly associated collocations seems to have been produced to facilitate the management of cognitive resources of interpreters, it is likely that the less abundant use of those four types of strongly associated collocations in interpreted speeches is relevant to the cognitively demanding nature of consecutive interpreting, which will be further discussed in Chapter Six.

When it comes to ADV+ADJ and V+ADV collocations in interpreted speeches, this study discovers that a large proportion of common collocations were produced due to the shift of transcoding, addition, and approximation. As shown in Table 5.8 and Figure 5.6, 46.86% of common ADV+ADJ collocations were transcoded from source speeches; interpreters used 35.90% of common V+ADV collocations to approximate the meaning of source speech expressions;

30.77% of common V+ADV do not have correspondences in source speeches and were added by trainee interpreters.

| | Addition | Approximation | Restructuring | Transcoding | Compression | Total |
|---|---|---|---|---|---|---|
| ADV+ADJ | 24.15% | 18.84% | 3.86% | 46.86% | 6.28% | 99.99% |
| V+ADV | 30.77% | 35.90% | 15.38% | 5.13% | 12.82% | 100% |
| Average | 27.46% | 27.37% | 9.62% | 26.00% | 9.55% | 100% |

Table 5.8 Interpreting shifts accompanying common collocations in CIS

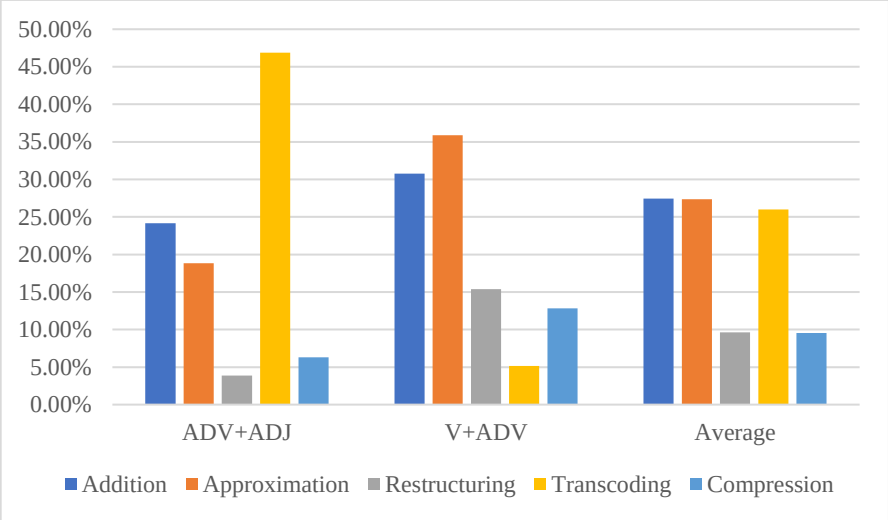



Figure 5.6 Interpreting shifts accompanying common collocations in CIS

The prevalence of common ADV+ADJ collocations in interpreted speeches may be attributed to the frequent occurrence of such collocations in the source speeches (e.g. 非常好 very good, 很难 quite difficult, 太简单 quite simple), which interpreters have memorised or taken note of and subsequently transcoded during interpretation. Furthermore, it appears that trainee interpreters tend to rely on common ADV+ADJ collocations when transcoding expressions from the source speech, even when more complex collocations could have been employed. This tendency is evident in the frequent use of very+ADJ collocations in interpreted speeches. Notably, among all the common ADV+ADJ collocations transcoded from source speeches, 47.42% consist of very+ADJ collocations. Examining source speech of those very+ADJ collocations, this study discovers that trainee interpreters rendered various adverbs in source speeches constantly into *very*, as in:

Example (47)

*SS: 非常得　　漂亮*

*fēichángde　piàoliang*

*very　　beautiful*

GT: *very beautiful*

IS: *very beautiful*

Alternative translation (AT): *so beautiful*

(Interpreter 11)

Example (48)

*SS: 很　　舒服*

*hěn　shūfu*

*very　comfortable*

*GT: very comfortable*

IS: *very comfortable*

AT: *very comfortable*

(Interpreter 24)

Example (49)

SS: 费用　是　*相当得　　高*

*fèiyòng　shì　xiāngdāngde　gāo*

cost　is　*very　　high*

GT: the cost is *very high*

IS: *very expensive*

AT: *quite expensive*

(Interpreter 13)

In those instances, interpreters consistently rendered three different adverbs, i.e., *非常得* (fēichángde, so), *很* (hěn, very), *相当得* (xiāngdāngde, quite), into *very*. As a result, the three ADV+ADJ collocations, namely, *very beautiful*, *very comfortable*, and *very expensive*, are all common collocations. As Granger (2009, p.151) notes, L2 English learners tend to overuse more "general-purpose" intensifiers, such as *very*, as the all-around option. Trainee interpreters in this

study similarly exhibited this tendency of using very+ADJ collocations as versatile options for transcoding the source speech. This inclination can be further attributed to the interpreters' knowledge of English adverbs, which will be discussed in Chapter Six.

In addition to transcoding source speech expressions into common collocations, trainee interpreters tend to use common collocations to approximate the meaning of the source speech expressions when encountering difficulties finding an equivalence of the source language expressions. This tendency is indicated by the 35.90% of common V+ADV collocations resulting from approximation. For instance, a four-character Chinese idiom *夺门而出* (force open the door and rush out) and the natural expression *落跑* (cut and run) in source speeches of the interpreting corpus were all rendered into the common collocation *run away* by the same interpreter (Interpreter 53). Since these two Chinese expressions do not have ready-made equivalence in English, to render them into English, the interpreter needs to search for words and construct expressions to convey the meaning of *夺门而出* accurately (force open the door and rush out) and *落跑* (cut and run). The use of the common collocation *run away* does not accurately reproduce the meaning of the source speech expressions. However, it may help the interpreter ease the possible cognitive burden brought by word searching.

### 5.3.4 Interpreting shifts and unnatural collocations

To elucidate the relationship between the five features of unnatural collocations and the interpreting process, a detailed examination of the interpreting shifts associated with these unnatural collocations was conducted. This revealed the potential impact of the interpreting process on features of unnatural collocations, as outlined in Table 5.9.

| | Addition | Approximation | Transcoding | Compression | Restructuring | Total |
|---|---|---|---|---|---|---|
| Confusing semantically related words | 7 (10.77%) | 22 (33.85%) | 20 (30.77%) | 3 (4.62%) | 13 (20.00%) | 65 (100.01 %) |
| Missing components | 0 (0%) | 2 (33.33%) | 2 (33.33%) | 0 (0%) | 2 (33.33%) | 6 (99.9% ) |
| Redundancy | 5 (21.74%) | 9 (39.13%) | 7 (30.43%) | 1 (4.35%) | 1 (4.35%) | 23 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | (100%) |
| Coinage | 5 (15.63%) | 9 (28.13%) | 14 (43.75%) | 1 (3.13%) | 3 (9.38%) | 32 (100.02 %) |
| Components inversion | 1 (50%) | 0 | 0 | 0 | 1 (50%) | 2 (100%) |
| Total | 18 (14.06%) | 42 (32.81%) | 43 (33.59%) | 5 (3.91%) | 20 (15.63%) | 128 (100%) |

Table 5.9 Interpreting shifts and features of unnatural collocations

An analysis of the source speech of the 128 unnatural collocations shows that the unnaturalness is frequently accompanied by shifts of transcoding (33.59%) and approximation (32.81%) (Table 5.9). For instance, among the 65 collocations featuring the confusion of semantically related words, 22 (33.85%) were used as approximations of source speech expressions. Furthermore, 20 collocations (33.33%) were transcoded from the source speech. When examining coined collocations, it was found that 14 out of 32 (43.75%) instances resulted from transcoding; while 9 out of 32 (28.13%) instances occurred when interpreters approximated the meaning of the source speech. Apart from approximation and transcoding, another noticeable linguistic shift frequently occurred alongside unnatural collocations - restructuring, accounting for 15.63%. For instance, out of 65 unnatural collocations (20%) featuring confusion of semantically related words, 13 are accompanied by the shift of restructuring. The influence of each type of interpreting shift on the naturalness of collocations in interpreted speeches will be discussed in the following paragraphs.

***Transcoding***

Transcoding may have contributed to the misuse of semantically related words in collocations. For instance:

Example (50)

| | | | | | | |
|---|---|---|---|---|---|---|
| SS: | 最后 | 第三个 | 元素 | 是 | 会 | 堂, |
| | *zuìhòu* | *dìsāngè* | *yuánsù* | *shì* | *huì* | *táng,* |
| | Last | third | element | is | assembly | hall, |

| 它 | 是 | 一个 | 公众 | 活动的 | *弹性 空间*。 |
|---|---|---|---|---|---|
| *tā* | *shì* | *yīgè* | *gōngzhòng* | *huódòngde* | *tánxìng kōngjiān*. |
| it | is | a | public | activities’ | *versatile space*. |

GT: The third element is the assembly hall. It is a *versatile space* for public events.

IS: The last element er is assembly hall. It is a very *elastic space*.

(Interpreter 71)

In this example, the speaker used *弹性 空间* (tánxìng kōngjiān, versatile space) to refer to the multi-function feature of the assembly hall. In this context, *弹性* (tánxìng, versatile) in the source speech means flexible and versatile. However, the interpreter rendered *弹性* (tánxìng) into *elastic*, which is one of the translations of the Chinese word *弹性 (*tánxìng*)*. It seems that the interpreter was not aware that *elastic* does not collocate with *space* and produced the unnatural collocation *elastic space* consequently. As noted by Men (2015, p.140), when a word in English learners' L1 has more than one translation in English, such a "coalescing" relation between words in learners' L1 and L2 may lead to the misuse of synonymous words in L2 English collocations. In this example, the Chinese word *弹性* (tánxìng, versatile) has more than one English translations, including versatile and elastic. It seems that the trainee interpreter, similar to other L2 English learners, was influenced by this one-to-many relation between the Chinese word in the source speech and its English translations when rendering *弹性 空间* (tánxìng kōngjiān, versatile space) word for word into English. In addition, the interpreter's lack of knowledge of whether *elastic* and *space* habitually co-occur may have also contributed to the production of the unnatural collocation.

In addition to the misuse of words for their synonyms in collocations, unnatural collocations coined by interpreters can be attributed to the transcoding shift. In the following example, the interpreter transcoded a source speech expression that cannot be interpreted literally into the target language and produced unnatural collocations.

Example (51)

SS: …也 可以 先 *抓住 一些 人的 胃*,

*...yě kěyǐ xiān zhuāzhù yīxiē rénde wèi*,

…also can first *grab some people's stomach*,

然后 再 让 他们 对 我们 这个 古 镇 产生 兴趣。

*ránhòu zài ràng tāmen duì wǒmen zhègè gǔ zhèn chǎnshēng xìngqù.*

and then let them to our this old town generate interest.

GT: … we can *attract tourists with local cuisines* first, and then make them interested in touring the old town.

IS: …we can also *grab the stomach* first. If they are interested in our local cuisines, then we have the interest.

(Interpreter 79)

In the source speech, the V+…+N collocation 抓住 (V) 一些人的 胃 (N) (zhuāzhù yīxiē rénde wèi, attract tourists with local cuisines), meaning *to attract tourists with local cuisines*, is a metaphorical expression and cannot be rendered literally into English. Metaphors in source speeches require interpreters to distinguish the metaphorical meaning from the literal meaning and to express the metaphorical meaning of the source speech expressions in the target language (Lang & Li, 2020). In addition, metaphors are highly culture-specific (Schäffner, 2017; Lang & Li, 2020). A metaphor may exist in one culture but does not exist in another. Therefore, to render a Chinese metaphor into English, the interpreter needs to know if a metaphor is shared by the source and the target languages. If the metaphor only exists in the source language, the interpreter may need to "deverbalise" the source speech expression, which means to preclude reliance on source language forms as much as possible and render the message rather than reproduce the form of source speech only (Seleskovitch, 1978, p. 9). In Example (51), the interpreter, who may not have time to construct an appropriate rendition, kept close to the source speech's surface structure and coined the collocation *grab the stomach*, which is not a natural expression in English.

The component redundancy in unnatural collocations also partly results from the interference of source speech expressions. In the example presented in Subsection 4.4.2, the interpreter produced an unnatural ADV+ADJ collocation *already visual*, in which the adverb was redundant. As analysed in Subsection 4.4.2, the collocation *already visual* can trace back to the Chinese expression *原有的视觉* (already visual). An examination of the source speech reveals that *原有的视觉* (already visual) occurs in source speeches.

Example (52)

SS: 好的, 那 下 一个 就是 AR 导航 技术。

*hǎode, nà xià yīgè jiùshì AR dǎoháng jìshù.*

OK, then next one is AR navigation technology.

它 是 一 种 啊 它 是 对于 *原有的 视觉的* 一 种 补充。

*tā shì yī zhǒng a tā shì duìyú yuányǒude shìjuéde yī zhǒng bǔchōng.*

It is a kind ah it is to *original vision* a kind supplement.

GT: *OK, the next is the AR navigation technology. It (AR navigation) enhances users' visual experience.*

IS: Right now, we are going to er walk you through the AR er navigation. So AR navigation is a supplement of your *already visual er experience*. It will enhance your visual experience.

(Interpreter 74)

In this example, the speaker introduced augmented reality (AR) navigation technology to audiences. This technology provides additional visual or audio information about things users see in real life. For instance, when users wearing an AR navigation device see an exhibit at a museum, the background information of the exhibit will automatically pop up in the AR navigation device, complementing what users see in real life. Therefore, the speaker describes the AR navigation as *对于 原有的 视觉的 一种 补充* (duìyú yuányǒude shìjuéde yī zhǒng bǔchōng, enhances one's visual experience), which means the AR navigation technology generates perceptual information overlaid on top of a real-world environment. In the source speech, the speaker used the adjective

*原有的* (yuányǒude, original) to modify the noun *视觉的* (shìjuéde, the original vision), highlighting that the AR navigation technology does not create an artificial environment for users but only adds information to users' vision. The interpreter followed the source speech structure and renders *原有的 视觉的* (yuányǒude shìjuéde, original vision) into *already visual (experience)*, in which the adverb *already* was redundant. L1 English raters note that the ADV *already* in *already visual* should be omitted, as the noun *supplement* before *the already visual experience* entails the meaning of adding new things to old things.

In Example (52), the unnatural collocation *already visual* was produced possibly because the interpreter was interfered with by the surface structure of the source speech expression *原有的 视觉的* (yuányǒude shìjuéde, original vision) and followed the source speech structure. After producing the collocation *already visual*, the interpreter seems to have realised the inappropriateness of the collocation and then used another sentence, i.e., *it will enhance your visual experience*, to further explain the meaning of the previous sentence. The addition of this sentence indicates that the source speech structure may have interfered with the production of the interpreted speech, which the interpreter was trying to avoid later.

Two unnatural collocations featuring missing prepositions were accompanied by the shift of transcoding.

Example (53)

SS: 好不容易 *到了 目的地* 又 被 告知 行李 运 丢了。

*hǎobùróngyì* *dàole mùdìdì* *yòu* *bèi* *gàozhī* *xínglǐ* *yùn* *diūle.*

With-great-difficulty *arrived destination* again was told luggage transport lost.

GT: When we finally *arrived at the destination*, we were told that the luggage was lost.

IS: And we *arrive the destination* we will find that our luggage is lost.

(Interpreter 76)

In this example, the interpreter rendered the Chinese V+N collocation *到了*(V) *目的地* (N)

(dàole mùdìdì, arrived (at) the destination) into *arrive the destination*, ignoring that as an intransitive verb, *arrive* cannot be directly followed by an object in English. Since in the source speech sentence, *到了* (dàole, arrive) and the object *目的地* (mùdìdì, destination) were not connected by a preposition, it is possible that the interpreter was interfered with by the source speech expression and omitted the preposition in the target speech.

***Approximation***

In addition to transcoding, unnatural collocations featuring the confusion of semantically related words, missing components, components redundancy, and coinage are frequently accompanied by the shift of approximation. When interpreters paraphrase or use an approximate translation to convey the meaning of the source speech expression (Bartłomiejczyk, 2006, p. 160; Kohn & Kalina, 1996), they seem to have no extra attention to be paid to the naturalness of the output, which possibly led to the occurrence of unnatural collocations.

In the following example, the interpreter coined an unnatural collocation to approximate the meaning of the source speech expression.

Example (54)

SS: …然后 去 *碰撞 出 这样 一 种 戏剧的 火花*。

*...ránhòu qù pèngzhuàng chū zhèyàng yī zhǒng xìjùde huǒhuā*.

…then to *collide out such a kind drama spark*.

GT: … then to collide with *a spark of drama*.

IS: …to er *make the chemistry* in the er drama.

(Interpreter 28)

The Chinese V+…+N expression *碰撞* (V)*...火花*(N) (pèngzhuàng … huǒhuā, collide with a spark (of drama)) does not have correspondence in English and cannot be rendered literally into English. The interpreter, who may have forgotten the exact expression in the source speech or did not have a ready-made translation for the source speech expression, coined a collocation, i.e., to *make the chemistry* to refer to *碰撞...火花* (pèngzhuàng … huǒhuā, collide with a spark), being unaware that *make* and *the chemistry* does not co-occur habitually in English. Consequently, the unnatural V+N collocation *make the chemistry* occurred. It seems that though the collocation

*make the chemistry* may not sound natural to target audiences, coining this collocation helps the interpreter avoid interrupting the flow of the interpreted speech and creating disfluencies.

Interpreters also confused semantically related words when using collocations to approximate source speech expressions. For instance:

Example (55)

SS: 那 我们 刚刚 提到的 是 整个 外部

*nà* *wǒmen* *gānggāng* *tídàode* *shì* *zhěnggè* *wàibù*

So we just mentioned is entire exterior

非常 尖锐的 一个 折 线,

*fēicháng* *jiānruìde* *yīgè* *zhé* *xiàn,*

ery sharp a fold line,

这个 黑色的 钢 板,

*zhègè* *hēisède* *gāng* *bǎn,*

this black steel plate,

相对于 整个 内部 *柔和的 曲线* 及 白色的 墙面

*xiāngduìyú* *zhěnggè* *nèibù* *róuhéde qūxiàn* *jí* *báisède* *qiángmiàn*

contrast whole interior *soft curves* and white walls

及 家具 形成 非常 强烈的 对比。

*jí* *jiājù* *xíngchéng* *fēicháng* *qiángliède* *duìbǐ.*

and furniture form very strong contrast.

SG: What we just mentioned is the very sharp edges and the black steel plates on the entire exterior of the building, which forms a very strong contrast with the *soft curves* of the entire interior, white walls, and furniture.

IS: Er so the= the exterior of the building which is characterized by a sharp edge and its black plane er sits in stark contrast with the *gentle feature* of the interior which is characterized by a white wall and white furniture.

(Interpreter 24)

In this example, the Chinese expression *柔和的 曲线* (róuhéde qūxiàn, soft curves) was interpreted as *the gentle feature*, an unnatural collocation. The interpreter seems to have confused *gentle* with *soft* and in the context of the target sentence, *soft feature* is more appropriate than *gentle feature*. It is possible that the interpreter retained only the information associated with the word *柔和的* (róuhéde, soft) from the source speech, overlooking the component *曲线* (qūxiàn, curves). Consequently, *gentle*, one of the English equivalents of 柔和的 (róuhéde, soft), was selected and combined with *feature*, a word semantically less specific than *曲线* (qūxiàn, curve) in the source sentence. This confusion between *soft* and *gentle* might have stemmed partly from the approximation process. Faced with potential memory decay of the source speech information, the interpreter might have been unable to allocate attention towards differentiating these two words, thereby leading to an unnatural output. Further, the interpreter might not know whether *gentle* and *feature* habitually co-occur in English. In this regard, a possible deficiency in English collocation knowledge may have also contributed to the occurrence of unnatural collocations.

***Restructuring***

Restructuring occurs when interpreters change the word order or the part of speech of words in the source speech without changing the meaning of the source speech message. In interpreted speeches, some unnatural collocations occurred when interpreters restructured source speeches. For instance:

Example (56)

| SS: 我 | *一滴* | *眼泪* | *也* | *不* | *会* | *掉*。 |
|---|---|---|---|---|---|---|
| | *wǒ* | *yīdī* | *yǎnlèi* | *yě* | *bù* | *huì* | *diào.* |
| | I | one | *tear* | also | not | will | *drop*. |

GT: I wouldn't *shed* *any* *tears* at all.

IS: I wouldn't er *drop* *any* *tears* at all.

(Interpreter 54)

In this example, the N+V collocation *眼泪* (N)...*掉* (V) (yǎnlèi…diào, tears drop), which can be rendered word for word into *any tears wouldn't drop*, was interpreted as *wouldn't drop any tears at all*. The verb *掉* (diào, drop) was moved forward and combined with *眼泪* (yǎnlèi, tears). Then, the interpreter rendered *掉 眼泪* (diào yǎnlèi, drop tears)word-for-word to *drop tears*. In this example, the change of word order may have led to the occurrence of unnatural collocation. Because when considering the word order difference between Chinese and English and adjusting the interpreting process, the interpreter may not have the extra cognitive capacity to pay attention to the naturalness of the target language production, which will be further discussed in Chapter Six. Consequently, the interpreter used one of the equivalents of *掉* (diào, drop) and rendered it into *drop*.

In the following example, which is reproduced from Example (3) in Subsection 4.4.2, the occurrence of the unnatural collocation *get her happiness* in interpreted speeches can also be attributed to the restructuring shift. In this example, the interpreter coined a collocation when restructuring the source speech expression:

Example (57) (reproduced from Example (3))

SS: 她 和 有妇 之夫 上床 只 是 为了 have fun,

*tā hé yǒufù zhīfū shàngchuáng zhǐ shì wèile have fun,*

She and married man sex just is for have fun,

为了 *让 自己 快乐*。

*wèile ràng zìjǐ kuàilè*.

for *make herself happy*.

GT: And she had sex with a man who has a wife just to have fun and *to make herself happy*.

IS: And erm what the reason why she had this extramarital affair with Sha Chenxing a married man is because she thinks he can *get her happiness*.

(Interpreter 27)

In this example, the V+N+ADJ collocation *让* (V) *自己* (N) *快乐* (ADJ) (rang zìjǐ kuàilè, make herself happy) in the source speech was rendered into a V+…+N collocation *to get her happiness*. The interpreter changed the part of speech of *快乐* (kuàilè, happy) from an adjective into a noun. In this example, the change of the part of speech is not obligatory. If the interpreter followed the

source speech's surface structure and interpreted it word by word to *make herself happy*, the target speech would sound natural. Interestingly, the unnatural collocation *get… happiness* can trace back to a natural Chinese expression, namely, *获得 幸福* (obtain/get happiness). In this context, it is likely that the Chinese expression *获得 幸福* (obtain/get happiness) in the interpreter's mental lexicon interfered with the target language production.

***Addition***

Some unnatural collocations occurred when interpreters added collocations to complete a source language message that is incomplete or not clear, which makes implicit source message more explicit. In the following instance, the interpreter confused a word with its synonym and produced an unnatural collocation when adding information to the source speech:

Example (58)

SS: 然后 第三个 是 就是 这个 文化上,

*ránhòu dìsāngè shì jiùshì zhègè wénhuàshàng,*

Then third is is this culture,

因为 你 之前 能够 借鉴的

*yīnwèi nǐ zhīqián nénggòu jièjiànde*

because you previously can refer-to

这些 科幻 电影 大部分 都是 西方的,

*zhèxiē kēhuàn diànyǐng dàbùfen dōushì xīfāngde.*

these sci-fi motives most are Western.

他们 文化 跟 我们 这个 东方的

*tāmen wénhuà gēn women zhègè dōngfāngde*

Their culture and our this Eastern

文化 相通性 比较 少。

*wénhuà xiāngtōngxìng bǐjiào shǎo.*

culture commonality relatively less.

GT: And the third (difficulty) lies in the culture (difference). Because most sci-fi movies that we can refer to are produced by Western countries whose culture does not share many common features with ours.

IS: And culture is also er *forming difficulties* for us because Western sci-fi is have a

cultural background that is difficult to be learned by our oriental counterparts.

(Interpreter 61)

The speaker was talking about difficulties they encountered when creating a film. When referring to the third difficulty, the speaker omitted the Chinese word *困难 (difficulty)* in *然后 第三个 是 就是 这个 文化上* (ránhòu dìsāngè shì jiùshì zhègè wénhuàshàng, and the third difficulty lies in the culture). The interpreter complemented the source speech by adding a V+N collocation *forming difficulties* after *the culture*, highlighting that the cultural difference between the East and the West is the third difficulty the speaker encountered in making the film. However, the collocation *forming difficulties* is unnatural and should be replaced by *causing*.

***Compression***

In some cases, unnatural collocations result from the process of compressing source segments into collocations. Compression is adopted by trainee interpreters to deal with lengthy or redundant source segments which pose challenges to memory retention. For instance:

Example (59)

SS: …只 *觉得 头部 好像 特别的 痛*。

*...zhǐ juéde tóubù hǎoxiàng tèbiéde tòng*.

…only *feel head seems very painful*.

GT: …I only *feel that my head seems to be extremely painful*.

IS: …But I only *feel a headache*.

(Interpreter 6)

In this example, the core information in the Chinese sentence segment *头部 好像 特别的 痛* (tóubù hǎoxiàng tèbiéde tòng, the head seems to be extremely painful) can be encapsulated in the word *headache*. It appears that the interpreter, having memorised or noted down the key information, compressed the Chinese segment into a noun *headache*. Subsequently, the noun *headache* was combined with a verb denoting the meaning of *觉得* (juéde, feel). However, it should be noted that in English, *have* is the verb that typically co-occurs with *headache* to convey the meaning of having pain in one's head. This example indicates that the interpreter may have allocated substantial cognitive resources to compressing the Chinese sentence segment, leaving

insufficient capacity to consider the correct verb to use in conjunction with *headache*. In the meantime, the interpreter may have been affected by the source language expression 觉得 (juéde, feel) and opted for the direct translation of 觉得 (juéde, feel). This case underscores the cognitive complexities of consecutive interpreting and the potential trade-offs between conciseness and naturalness in target language production.

### 5.4 Summary

This chapter reports findings of congruent collocations and interpreting shifts, and their relations with natural and unnatural collocations in interpreted speeches. Congruent collocations were identified in both natural and unnatural collocations, reflecting the possible influence of the source language. A total of five types of shifts were discerned: transcoding, addition, approximation, restructuring, and compression.

Remarkably, many collocations in interpreted speeches were not present in source speeches and were added by interpreters to clarify the meaning of source speeches or to fill the gap of information loss in the interpreting process. Adjustments in word order and parts of speech of source speeches resulted in the production of collocations. Some collocations were rendered word-for-word from source speech expressions, while others were generated to approximate the meaning of source speech expressions. In addition, interpreters compressed some source speech sentence segments or sentences into collocations.

The distinct collocation features of interpreted speeches documented in Chapter Four can be partially attributed to interpreting shifts. For instance, interpreters frequently transcoded N+N and ADV+ADJ collocations from source speeches, potentially leading to the higher frequency of these collocation types in interpreted speeches compared with L1 English speeches. Furthermore, a significant proportion of ADJ+PREP and N+PREP collocations occurred as a result of restructuring shifts. This indicates the structural and grammatical differences between Chinese and English may have led to the overuse of ADJ+PREP and N+PREP collocations in interpreted speeches. In addition, many PREP+N collocations, particularly discourse organisers, were added

by interpreters, which may be relevant to the frequent occurrence of PREP+N collocations in interpreted speeches.

In terms of collocation diversity, interpreters frequently transcoded recurrent expressions in source speeches, and repeatedly used certain collocations to approximate and restructure the source speech, all of which may have increased the repetitiveness of collocations in interpreted speeches. As for the complexity of collocations, trainee interpreters transcoded a large proportion of strongly associated technical terms from source speeches. Despite this, interpreted speeches still contain less strongly associated collocations than L1 English speeches. This observation suggests that source speeches delivered at the mock conferences may have been less technical than L1 English speeches delivered at TED conferences. Moreover, it could imply a potential loss of technical terms during the interpreting process, reducing the complexity of collocations in interpreted speeches. In addition to strongly associated collocations, many common collocations were transcoded from source speeches, produced to approximate source speeches, or added to clarify source speeches and fill the information loss in the interpreting process. These interpreting shifts indicate the possible cognitive burdens interpreters were facing. Using a larger proportion of common collocations than L1 English speakers, interpreters seem to be easing the cognitive load and trade naturalness for fluency. When it comes to unnatural collocations, this study discovers that they were accompanied by the five types of interpreting shifts, among which transcoding and approximation occur more frequently than the other three types. The next chapter proceeds to elucidate findings presented in Chapter Four and Chapter Five from a cognitive perspective, using the theoretical framework established in Section 2.5.

# Chapter Six. Discussion

This chapter provides an in-depth elucidation of the research findings in the previous two chapters, through the lens of theories of late bilinguals' mental lexicon (e.g. Kroll & Stewart, 1994; Langacker, 1987), the language control and source language interference in interpreting (Christoffels & De Groot, 2005; De Groot & Christoffels, 2006; Dong & Li, 2020), and working memory (e.g. Baddeley, 2009a; Baddeley & Hitch, 1974). The focus of this discussion is to uncover how the cognitive processes of trainee interpreters may have influenced their use of collocations in Chinese-to-English consecutive interpreting. Section 6.1 discusses the possible influence of the interpreters' Chinese and English mental lexicon. Subsequently, Section 6.2 explains the language control in the interpreters' cognition and how the source language interference may have impacted the collocation features of interpreted speeches. Section 6.3 focuses on the potential influence of limited working memory capacity and the multitasking nature of consecutive interpreting. Finally, Section 6.4 synthesises the possible collective effects of the aforementioned three elements—the mental lexicon, the parallel processing of Chinese and English, and constrained working memory capacity—on using collocations in interpreted speeches.

## 6.1 Mental lexicon and the use of collocations in consecutive interpreting

### 6.1.1 Number of collocations stored in interpreters' English mental lexicon

As reviewed in Subsection 2.5.1, theories of late bilinguals' mental lexicon (e.g. Jiang, 2000; Kroll & Stewart, 1994) posit that late bilinguals', including advanced English learners' L1 and L2 are stored separately in the mental lexicon, sharing the same conceptual memory. When acquiring the L2, English learners at an early stage mainly rely on their L1 mental lexicon to memorise L2 words or collocations. That means learners first connect L2 surface structures with corresponding L1 surface structures and then associate the L1 surface structures with the conceptual memory instead of directly associating L2 surface structures with concepts. In this process, the existing L1 mental lexicon will restrict L2 words or collocations learners acquire, making collocations that are congruent, i.e. structurally symmetric, in learners' L1 and L2 more salient in learners' memory (Jiang, 2000; Wolter & Yamashita, 2015). It is believed that for most learners, fossilisation would occur at the late stage of L2 acquisition even if "extensive contextualised input is available" (Jiang, 2000, p.54). Even advanced L2 English learners would mainly have L2

collocation knowledge that is copied over from L1 into L2. In comparison, incongruent L2 collocations, i.e. collocations that only exist in the L2 and cannot be translated word for word into learners' L1, are less salient or are not stored in learners' memory. English learners' English mental lexicon would be smaller than their L1 mental lexicon and the English mental lexicon of L1 English users. This would further restrict the number of L2 lexical items learners can produce, including L2 English collocations.

In Chinese-to-English consecutive interpreting, the use of collocations by Chinese-speaking trainee interpreters may be associated with the possibly smaller size of their English mental lexicon. This influence from mental lexicon is reflected in the less frequent occurrence of certain types of collocations, the more repeated use of collocations, and the use of unnatural collocations in interpreted speeches. In Chapter Four, it is discovered that interpreted speeches include significantly fewer V+N, ADJ+N, N+V, V+ADV, and V+PREP collocations than L1 English speeches. This may be because the trainee interpreters, as L2 English speakers, have fewer of these five types of collocation stored in their mental lexicon. Though the trainee interpreters are all highly proficient L2 English speakers in this study, they may still have a limited number of English collocations stored in their mental lexicon compared with L1 English speakers (Jiang, 2000; Kroll & Stewart, 1994; Wolter & Yamashita, 2015). Therefore, it is plausible that the less abundant use of these five types of collocations in their interpreted speeches is due to the limited collocation knowledge of the interpreters.

In addition to the five types of underused collocations, the other five types of collocations, i.e. N+N, N+PREP, PREP+N, ADV+ADJ, and ADJ+PREP collocations, occur more frequently in the interpreted speeches, which seems to indicate that the interpreters have more of these collocations stored in their mental lexicon than L1 English speakers. However, as shown in Subsection 5.2.1, about half of N+N and ADV+ADJ collocations were transcoded from source speeches; approximately half of N+PREP and ADJ+PREP collocations occurred due to the interpreters adjusting the word order or part of speech of source speech expressions; and around half of PREP+N collocations were added by the interpreters, a practice which was possibly adopted to compensate for the information loss in the interpreting process, gaining the interpreters time to manage their limited cognitive resources. These findings suggest that expressions in source

speeches, as well as the limited capacity of the interpreters' working memory, may have influenced their linguistic choices in the interpreting process, which further contributed to the overproduction of the five types of collocations. Therefore, the overproduction of these five types of collocations appears to be associated with the interpreting process rather than an indication of superior English collocation knowledge of the interpreters.

The limited number of collocations stored in the interpreters' mental lexicon may also explain the lack of diversity of collocations in interpreted speeches. Since N+PREP and N+N collocations are significantly less diverse in interpreted speeches than in L1 English speeches, examples of these two types of collocations are used here to illustrate how the limited collocation knowledge may have influenced the diversity of the use of collocations by the trainee interpreters in this study. As revealed in Subsection 4.1.2, the interpreters repeatedly produced certain N+PREP collocations such as *relationship between, place for, information about, knowledge about, differences between,* instead of using alternatives such as *association between, details on, insights into,* and *disparities between*. It is likely that the alternate collocations do not exist or are not salient in the interpreters' mental lexicon. Therefore, when producing interpreted speeches, the interpreters stuck to collocations that they were more familiar with and repeatedly used familiar collocations to avoid making errors in interpreted speeches (Marco, 2009; Tsai, 2005). The repeated use of certain N+N collocations in interpreted speeches can be similarly explained. As revealed in Subsection 4.1.2 and Subsection 5.2.2, the interpreters repeatedly used a small group of topic-related collocations, such as *Science Park, game player,* and *project manager*, most of which were transcoded from source speeches. It is possible that since the interpreters are not experts in the topic covered by the source speeches, they only have a limited range of topic-related N+N collocations stored in their mental lexicon, tending to keep close to terms and proper names mentioned by speakers and repeatedly using those collocations. In contrast, the L1 English speakers in this study are experts in the field of their speeches and may have a larger range of topic-related N+N collocations stored in their mental lexicon. Therefore, L1 English speakers produced a larger range of topic-related N+N collocations in producing interpreted speeches than the interpreters.

The use of unnatural collocations in interpreted speeches may also be explained with English collocations in the interpreters' mental lexicon. Similar findings have been discussed in the context of L2 English learners (Men, 2015; Wang & Shaw, 2008). As Nesselhauf (2005) suggested, generally, words stored in L2 English users' mental lexicon are more loosely connected than those in L1 English users' mental lexicon. Therefore, associations between components of collocations stored in L2 English users' mental lexicon are easier to break, with components replaced or supplemented by other words. This explains why unnatural collocations in interpreted speeches, as discovered in Subsection 4.4.2, feature misuse of synonyms (e.g. *form difficulties* for *create difficulties*), component redundancy (e.g. *career life* for *career*), component inversion (e.g. *introduce briefly* for *briefly introduce*), the creation of non-existent collocations in English (e.g. *message angel* for *angel*), and missing components (e.g. *in end*). Most of these features involve breaking the association between components of natural English collocations, indicating the weak association between words stored in the interpreters' mental lexicon.

For example, *make an effort* was misused as *take an effort* in the interpreting corpus. This might be because *make* and *effort* are not strongly associated with the interpreter's mental lexicon. In other words, *make an effort* may not have been stored as a whole chunk in the interpreter's memory. Intending to convey the meaning of *make an effort* in the interpreted speech, the trainee interpreter seems to have constructed a V+N structure by combining a verb and a noun with the meaning of *make* and *effort*. Since *make* and *take* both have the meaning of obtaining and achieving, when producing the V+N collocation, the trainee interpreter, possibly without a clear idea of whether *take* and *effort* are compatible with each other and not having the collocation *make an effort* stored in their mental lexicon as a whole chunk, misused *take* for *make* and produced *take an effort*. As He (2019) noted, interpreters' knowledge of the conventionality of the source and the target language interferes with the formulation of interpreted speeches in interpreting. It is possible that not knowing the collocating relation between two words, the trainee interpreters produced the unnatural collocation *make an effort* based on the English grammatical rule and the literal meaning of individual words in the collocation.

Overall, typical collocation features observed in the interpreted speeches indicate the possible influences from the interpreters' English mental lexicon. The less abundant and less diverse use

of collocations and the production of unnatural collocations may all be related to collocations stored in their mental lexicon. This characteristic of the L2 mental lexicon is backed by theories of late bilinguals' mental lexicon and empirical studies in L2 acquisition (Jiang, 2000; Kroll & Stewart, 1994; Nesselhauf, 2005). As researchers in L2 acquisition studies have pointed out, L2 English users may have a narrower range of collocations stored in their mental lexicon than L1 English users (Lu, 2016; Men, 2015; Nesselhauf, 2005; Wang & Shaw, 2008). This discrepancy may be because L2 English learners are unaware of the compatibility between words, focusing more on individual words and grammatical rules when learning English. Similarly, the trainee interpreters participating in this study may be unaware of the importance of collocations in English language acquisition. Consequently, they may possess a limited repository of collocations within their mental lexicon and thus utilise collocations to a lesser degree in Chinese-to-English consecutive interpreting than L1 English speakers.

### 6.1.2 Features of collocations stored in interpreters' English mental lexicon

In addition to the less abundant storage of English collocations, features of collocations stored in the interpreters' English mental lexicon may have also influenced how the interpreters use collocations in interpreted speeches. As revealed in Section 4.3, collocations in interpreted speeches comprise a larger proportion of common collocations and a smaller proportion of strongly associated collocations than those in L1 English speeches. This finding indicates that interpreted speeches in this study are less collocationally complex than L1 English speeches, corroborating findings from L2 acquisition studies that L2 English learners use less strongly associated collocations but more common collocations than L1 English (Durrant & Schmitt, 2009). Durrant & Schmitt (2009) suggested that L2 English learners seem to acquire common collocations more than strongly associated ones when learning English. With regard to the trainee interpreters, who are L2 English speakers, it is conceivable that they may have assimilated an extensive number of common English collocations. However, they might have a diminished quantity of strongly associated ones stored in their mental lexicon. Consequently, they may employ these common collocations more and strongly associated collocations less than L1 speakers.

It might be the case that the number of common and strongly associated collocations stored in interpreters' mental lexicon is related to the frequency of their encounters with these two types of collocations during English acquisition. As reviewed in Subsection 2.3.1, frequent exposure to lexical items during language acquisition promotes a deeper entrenchment of these items in the learners' memory (Bybee, 2007; Bybee & Hopper, 2001). Given their ubiquity in English, common collocations are more likely to be encountered by interpreters during English learning than strongly associated collocations, which are less frequent. In view of this, trainee interpreters are likely to have greater exposure to, and therefore a more salient metal lexicon of, common collocations. In addition, the frequent re-encounters with previously acquired common collocations may reinforce the memory of those collocations (Carroll & White, 1973), increasing their prevalence in interpreted speeches. In comparison, strongly associated collocations are less likely to be frequently encountered by interpreters and may "take longer to acquire" (Durrant & Schmitt, 2009, p.174). Therefore, there may be fewer strongly associated collocations stored in the mental lexicon of the trainee interpreters. Compared with the trainee interpreters, L1 English speakers in this study are likely to have more exposure to strongly associated collocations, leading to a richer mental lexicon of those collocations. As a result, L1 English speakers used a larger proportion of strongly associated collocations than the trainee interpreters.

In addition to the frequency effect of L2 collocation acquisition discussed above, collocations produced by the trainee interpreters also reflect the possible influence of the Chinese mental lexicon on collocations stored in the interpreters' English mental lexicon. As reviewed in Subsection 2.5.1, the RHM model of late bilinguals' mental lexicon proposes that the L2 mental lexicon of language learners is associated with the L1 mental lexicon through the lexical link, and many lexical units stored in learners' L2 mental lexicon are translated equivalents of those in learners' L1. Along with the RHM theory, Jiang's (2000) and Wolter and Yamashita's (2015) theories of L2 vocabulary and collocation acquisition also explain how L2 collocations in learners' mental lexicon are influenced by their L1. Jiang (2000) proposed (see also Wolter & Yamashita, 2015) that the acquisition of L2 knowledge, including collocation knowledge, can be divided into three stages. The first stage of L2 acquisition is linking L2 words with corresponding L1 words, which are further associated with concepts in L2 learners' minds. In the second stage, learners may replicate the lemma knowledge of L1 and insert L2 words acquired into L1 grammatical structures to create L2 collocation entries that are L2-like at the lexeme level but L1-

like concerning both the grammatical structure and meaning. When it comes to L2 collocation knowledge, language learners in the second stage mainly have L2 collocational knowledge that is copied over from L1 into L2 (Wolter & Yamashita, 2015). When producing L2 collocations, learners at this stage tend to frequently use those having word-for-word translational equivalence to the L1, which are also known as congruent collocations (Wolter & Gyllstad, 2011; Wolter & Yamashita, 2015). At the third stage, learners would gradually replace L1 lemma knowledge with more appropriate L2 lemma knowledge and accumulate more collocations that are habitually used in the L2 but cannot be translated back into the L1, i.e. incongruent collocations. However, as Jiang (2000) suggested, for many learners, even if they acquire more L2 incongruent collocations and reach the third stage, they may still have many congruent collocations stored in the mental lexicon and frequently use those congruent collocations in L2.

In this study, many collocations produced by trainee interpreters are congruent collocations that have word-for-word translations in Chinese, such as *very happy* (非常 高兴), *more stable* (更 稳定), *also difficult* (也 难), *answer my question* (回答 我的 问题), *bring a change* (带来 改变), and *play the game* (玩 游戏). Trainee interpreters may have been influenced by the L1–L2 congruency effect (Jiang, 2000; Wolter, 2006; Wolter & Gyllstad, 2011; Wolter & Yamashita, 2015) in acquiring English. In other words, the acquisition of English collocations may have been influenced by the Chinese surface structure stored in their mental lexicon. The interpreters may have replicated the semantic and syntactic information from Chinese at the lemma level into the English collocational entry when acquiring English collocations (Jiang, 2000; Jiang, 2022). Consequently, English collocations stored in the interpreters' mental lexicon may be largely based on the Chinese semantic and syntactic information, which further influences the interpreters' use of collocations in interpreted speeches.

The order/age of acquisition effect (Wolter and Yamashita, 2015), grounded in the mapping theory of learning (Ellis & Lambon Ralph, 2000; Izura et al., 2011; Lambon Ralph & Ehsan, 2006; Monaghan & Ellis, 2002), can further explain the trainee interpreters' frequent use of congruent collocations. As reviewed in Subsection 2.3.2, the mapping theory suggests that the order in which knowledge is acquired significantly influences how salient it is in one's memory

(Ellis & Lambon Ralph, 2000; Lambon Ralph & Ehsan, 2006; Monaghan & Ellis, 2002). In this study, the trainee interpreters may have acquired many congruent English collocations based on Chinese semantic and syntactic information at the beginning of English learning (Jiang, 2000; Jiang, 2022). After acquiring these congruent collocations, the trainee interpreters may have been exposed to more congruent English collocations, and thus have congruent collocations stored in their mental lexicon strengthened through repeated exposure. The memory of incongruent collocations, which are acquired later than congruent collocations, may not be as salient as congruent collocations due to a lack of repeated exposure (Wolter & Gyllstad, 2013).

It needs to be clarified here that the influence of the trainee interpreters' L1 on collocations stored in their L2 mental lexicon discussed in this section occurs both at a textual level and in the interpreters' mental lexicon. Some congruent collocations in interpreted speeches can be traced back to expressions in source speeches, indicating the source speech's auditory and/or visual influence on the interpreted speech's structure and/or lexis (Lamberger-Felber & Schneider, 2008). When this influence of source speech expressions occurs, the interpreters borrow the surface structure of the source speech and reproduce the source speech surface structure in interpreted speeches. Other congruent collocations do not have correspondences in source speeches, meaning that the influence of the interpreters' L1 occurs mentally in the mental lexicon.

Overall, the Chinese and English mental lexicon of trainee interpreters seem to be an integral part of the dynamic creation of English-interpreted speeches. The number and features of collocations stored in the interpreters' English mental lexicon influence their use of collocations in interpreted speeches, distinguishing the collocation pattern of interpreted speeches from L1 English speeches. Based on theories of late bilinguals' mental lexicon, it seems that the awareness of the collocability of words in English, the exposure to high frequency and rare collocations in English learning, and the Chinese mental lexicon of interpreters may all influence English collocations stored in interpreters' mental lexicon. The influence of the mental lexicon discussed in the present study mainly corroborates with what He (2019) calls "the recoding of the source message in the target language" (p. 31) in interpreting. In the target speech production phase, interpreters need to either generate L2 surface structures via grammatical parsing (computation-based processing), i.e.

building up a grammatical structure and filling in words into the structure[21] or draw on expressions stored in the mental lexicon (memory-based processing) to verbalise concepts denoted in the source speech. In this process, as discussed above, L2 English collocations stored in interpreters' mental lexicon may influence the use of collocations by the trainee interpreters in target language production.

Apart from the mental lexicon, language control and the interference of the source language may also have influenced the use of collocations in the interpreted speeches, as discussed in the following section.

### 6.2 The influence of the co-activation of Chinese and English

As reviewed in Subsections 2.5.2, in interpreting, both the source and target language systems of interpreters are activated (Christoffels & De Groot, 2005; De Groot & Christoffels, 2006; Dong & Li, 2020). Interpreters need to inhibit the language not in use and activate the intended language during target speech production. However, in real interpreting, the source language system may not be fully inhibited and may interfere with the target language production (Wang & Zou, 2018; Ma & Cheung, 2020). In this study, features of the collocations produced in the interpreted speeches reflect the possible co-activation of the Chinese and English mental lexicon of the trainee interpreters and the potential interference from their Chinese language system in the interpreting process.

As reported in Subsection 4.4.2 and Subsection 5.2.4, 65 (50.78%) unnatural collocations in interpreted speeches include components that are misused for their synonyms. Examining the correct form of these unnatural collocations, it is not difficult to notice that many of them are what Men (2015) described as "partially congruent" (p. 139) collocations in Chinese and English. That is, only one component of the correct form has a one-to-one translation in Chinese, whereas the other component or components may be one of several possible translations of a Chinese word. When using these partially congruent collocations, interpreters are likely to be experiencing interference from Chinese expressions or the multiple alternative translations of

[21] This notion is similar to the open-choice principle proposed by Sinclair (1991).

these Chinese expressions and produce unnatural collocations. For instance, in Example (57) in Subsection 5.2.4, Interpreter 54 produces the unnatural collocation *drop tears*, misusing the verb *drop* for its synonym *shed*. In the correct collocation *shed tears*, *tears* have only one translation in Chinese, i.e. *眼泪* (tear), whereas *shed* is one of the translations of the Chinese word *掉 (shed, drop, fall, lose)*. It seems that the Chinese word *掉* (shed, drop, fall, lose) and one of its English translations *drop* has interfered with the production of the correct collocation, *shed tears*, and induced the unnaturalness. Other examples of unnatural collocations occurring due to the one-to-many relation between Chinese and English words include *true relationship* for *real relationship* (真正的 real, true, genuine 关系 relationship), *decrease the fear* for *reduce the fear* (减少 decrease, reduce, lessen 恐惧 fear), *fragmented time* for *divided time* (碎片化 divided, fragmented 时间 time), *relate with* for *relate to* (与 with, to … 相关 relate). In these examples, Chinese words stored in interpreters' mental lexicon may have interfered with the collocational links among words in interpreters' English mental lexicon, inducing the misuse of words for their synonyms in collocations.

In other instances, interpreters seem not to know the collocate of a certain word and produce collocations that are literal translations of Chinese collocations. However, the collocations interpreters produce are unnatural because they include components that should be substituted by a semantically related word in English. For instance, a trainee interpreter in this study produced the unnatural collocation *love drama*, which is a literal translation of the Chinese expression *爱情剧* (love drama). However, in English, the word *romantic* instead of *love* collocates with drama to convey the meaning of *爱情剧* (love drama) in Chinese. The trainee interpreter seems to have experienced interference from the expression in Chinese and produced the unnatural collocation. Similarly, the unnatural collocation *grasp the intention* in interpreted speeches can be traced back to the Chinese expression *抓住意图* (grasp the intention), meaning understanding someone's intention. However, in English, *grasp* does not habitually co-occur with *intention*. Instead, L1 English speakers use *get the intention* or *understand the intention* to convey the concept of *抓住意图* (grasp the intention) in Chinese.

This interference from the Chinese in the use of collocations in interpreted speeches is also reflected in unnatural collocations with other features. For instance, many unnatural collocations seem to have been coined based on Chinese expressions, such as *message angels* (信 message 使 angel) for *angels*, *meet some robbers* (遇到 meet 劫匪 robbers) for *get robbed*, *architect master* (建筑 architect 大师 master) for *the master builder*, and *pillar programmes* (支柱 pillar 项目 programme) for *core programmes*. It is possible that when encountering difficulties expressing concepts in the target language, the trainee interpreters strategically translated Chinese expressions stored in their mental lexicon word for word into English to convey the intended concept. It is also likely that interpreters unconsciously experienced interference from Chinese expressions in their mental lexicon or in the source speeches and were unaware that the Chinese-influenced collocations they produced did not conform to the conventionality of English. Component redundancy in unnatural collocations in interpreted speeches may also be attributed to the interference from the Chinese. For instance, interpreters produced *innovation points* (创新 innovation 点 points) for *innovation*, *career life* (职业 career 生涯 life) for *career*, *gathering party* (聚 gathering 会 party) for *party*, and *already visual* (原有的 already 视觉 visual) for *visual*, all of which can be translated word for word into natural Chinese expressions.

In other cases, the interference from the Chinese seems to have led to the omission of components in collocations. For instance, interpreters produced *ask (for) information* (问 ask 信息 information), *care (for) friends* (关心 care 朋友 friends), *in (the) past* (在 in 过去 past), *arrive (at) the airport* (到达 arrive 机场 airport), *arrive (at) the destination* (到达 arrive 目的地 destination). In these examples, the interpreters omitted prepositions and articles in collocations, which seem to result from the influence of Chinese expressions. This is due to the fact that prepositions and articles in English are actively used. As Kennedy (2014) noted, there is one preposition in every eight words in English. In addition, English has an article system that marks definiteness and specific/generic reference (e.g. Biber et al., 2002; Hawkins, 1991). However, in Chinese, many prepositions are developed from verbs and are used as both verbs and prepositions. Strictly speaking, there is no word serving only as a preposition in Chinese (Lian, 1993; Shih, 2012). Additionally, in many cases, Chinese words do not have to be connected with prepositions. For instance, in Chinese, the verb *到达* (arrive) can be followed by the noun *目的地* (the

destination), but in English, *arrive* and *the destination* need to be linked by the preposition *at*. Regarding articles, the Chinese language does not have an article system that marks definiteness and specific/generic reference (Diez-Bedmar & Papp, 2008). For instance, as illustrated by the Chinese translation of unnatural collocations featuring missing components, the verb *问* (ask) and the noun *信息* (information) do not need to be connected by a preposition in Chinese. However, when conveying the concept of *问信息* (ask information) in English, the interpreter needs to add the preposition *for* to connect the two words. Under the interference from the Chinese source expression and the influence of the Chinese language system, the interpreter missed the preposition and produced an unnatural collocation *ask information*.

The interference of the source speech in the production of interpreted speeches has been examined by previous researchers (Pöchhacker, 1994; Lamberger-Felber & Schneider, 2008). Interference refers to the influence of the source speech on the interpreted speech's structure and/or lexis (Lamberger-Felber & Schneider, 2008). When morphosyntactic structures differ between the source and target languages, interference is likely to occur (Gile, 2009). As a result, the source speech's lexical, syntactical, grammatical, or phonetical features are projected to the interpreted speech (Lamberger-Felber & Schneider, 2008). When interference occurs, interpreters produce expressions with the different semantic, connotative, or functional values of expressions in the source speech (Lamberger-Felber & Schneider, 2008). Previous studies seem to mainly focus on interference occurring at the textual level. When interference occurs, the surface structure of the source speech expression is reproduced in interpreted speeches. However, the present study finds that interference may stem not only from expressions occurring in source speeches but also from Chinese expressions not present in source speeches, indicating that Chinese expressions stored in interpreters' mental lexicon may also influence their use of collocations.

For instance, in Example (13) analysed in Subsection 4.4.2, Interpreter 59 produces the unnatural collocation *message angel*, which has a literal correspondence in Chinese, namely, *信* (message) *使* (angel). Checking the source speech of this unnatural collocation, it appears that the Chinese

expression *信使* (message angel) did not occur in the source speeches. Instead, the interpreter may have coined this collocation based on the Chinese expression stored in their mental lexicon.

Example (60) (reproduced from Example (13) in Subsection 4.4.2)

SS: 而 到了 耶诞节 前夕呢,

*ér dàole yēdànjié qiánxīne,*

And when-it-comes-to Christmas Eve,

拼凑出的 整张 卡片 秀出了 这 一段 祝贺语 ,

*pīncòuchūde zhěngzhāng kǎpiàn xiùchūle zhè yīduàn zhùhèyǔ,*

assembled entire card shows this piece greeting,

那 就*是* *Angels can fly because they take themselves lightly*。

*nà jiùshì Angels can fly because they take themselves lightly.*

that is *Angels* can fly because they take themselves lightly.

GT: On Christmas Eve, the gift cards assembled show the greeting: *Angels* can fly because they take themselves lightly.

IS: So when it comes to Christmas Eve you will be able to find a full picture like this. And the *message angels* can fly because they take themselves fly.

(Interpreter 59)

As shown in the source speech sentence, the speaker quotes an English sentence from the gift cards, i.e. “Angels can fly”. However, it seems that the trainee interpreter forgot the whole sentence quoted by the speaker and failed to reproduce the word *angel* and *lightly* in the source speech. In this process, the Chinese expression *信 使* (message angel) seems to have interfered with the reproduction of the quote in the source speech and led to the use of the unnatural collocation *message angels*. Since *信 使* (message angel) did not occur in the source speech, it is likely that the interference occurred mainly in the mental lexicon of the interpreter, indicating the inter-language interference observed in L2 English production (Gilquin, 2007; Waibel, 2007).

Apart from the instance of *message angel*, many unnatural collocations with traces of Chinese expressions in interpreted speeches cannot be traced in source speeches, such as *get happiness* (获得 get 快乐 happiness), *love world* (爱情 love 世界 world), *mature mechanism* (成熟的 mature 机制 mechanism), and *visional impact* (视觉 visional 冲击 impact). All these examples indicate that in Chinese-to-English consecutive interpreting, language processing involves two languages instead of one. Trainee interpreters may also have their Chinese mental lexicon activated when producing interpreted speeches in English, and the activated Chinese mental lexicon may then interfere with the use of collocations in the target language.

In addition to the interference of the Chinese mental lexicon, this study also observed the influence of expressions in Chinese source speeches on collocations in interpreted speeches. As illustrated in Subsection 5.2.4, unnatural collocations such as *elastic space*, *grab the stomach*, and *arrive the destination* were all transcoded from expressions in source speeches. According to theories of the co-activation of two language systems in interpreting, it is very likely that the surface structure of Chinese expressions in source speeches enhanced the activation of the interpreters' Chinese mental lexicon, making it more difficult for them to inhibit the Chinese language system not in use in the target speech production phase. Consequently, expressions in the Chinese speeches may have interfered with the use of English collocations and induced unnaturalness.

The interference of the source text in the target text has been argued by translation scholars (Chesterman, 2011; Toury, 2012; Tirkkonen-Condit, 2005) as an inherent feature and a default mode of the translation process. In the translation process, translators automatically follow the surface structure of the source text and produce translations that show the maximum formal correspondence of the source text (Chesterman, 2011). To avoid interference, translators need to make special efforts to restructure the source text and conform to the target language's conventionality (Toury, 2012). It is difficult for all translators to identify all the interferences in the source text and avoid them, as it requires significant mental effort, source and target language proficiency, and translation expertise. Therefore, translated texts will inevitably include

deviations from the general target language patterns, with the source text being the source of the deviation (Toury, 2012).

Similarly, in Chinese-to-English consecutive interpreting, interpreters are also likely to be influenced by the source speech. Different from translators who have time to evaluate the source text and edit the translated text, interpreters work under time constraints. They must produce the interpreted speech within the time limit and do not have much time to check the source speech and evaluate and revise the interpreted speech. To attain maximum communicative efficiency with minimum cognitive effort, interpreters are likely to keep close to the surface structure of the source speech, and interpreted speeches are more likely to manifest linguistic features of source speeches (Lin et al., 2018; Paradis, 1994, p.297). In consecutive interpreting, although there is a time lag between the source speech and the production of the interpreted speech and interpreters may not be able to fully remember the surface structure of the source speech when producing the interpreted speech, interpreters take notes when listening to the source speech. Therefore, the interference of the source speech may also be an inherent feature of Chinese-to-English consecutive interpreting. Under the influence of such an inherent feature, interpreters may most likely produce collocations embodying the features of source expressions.

Though the use of some collocations seems to result from the interference of the Chinese language system, the trainee interpreters also demonstrated instances of the successful inhibition of the source language system in producing interpreted speeches, which enabled them to avoid interference from source speech expressions. The inhibition of the Chinese language system is manifested by collocations accompanied by restructuring shifts. As reported in Section 5.1, 24% of collocations were produced because the interpreters adjusted a part of speech or word order of source speech expressions. In particular, 52.13% of ADJ+PREP and 54.63% of N+PREP collocations were produced due to the restructuring shifts, which may have contributed to the more frequent use of these two types of collocations in interpreted speeches. The restructuring shifts occurred due mainly to the grammatical and structural differences between Chinese and English. The restructuring of source speech expressions requires the inhibition and activation mechanism (Costa, 2005) in the language processing of interpreters. With this mechanism, interpreters may inhibit the interference from grammatically asymmetrical expressions in Chinese

source speeches, which require restructuring when translated from Chinese into English. Otherwise, interpreters may produce ungrammatical expressions with features of Chinese structures. In the following example, which has been presented in Subsection 5.1.2, the interpreter successfully inhibits the Chinese language system and avoids interference from the grammatical structure of the source language expression.

Example (61) (reproduced from Example (34) in Subsection 5.2.2)

SS: 其实 本地化 这个 东西

*qíshí* *běndìhuà* *zhègè* *dōngxi*

Actually localization this thing

大家 到 现在 为止 *对 它 都还 有 一些 误解*。

*dàjiā dào xiànzài wéizhǐ duì tā dōuhái yǒu yīxiē wùjiě*.

everyone till now up-to *about it still have some misconception*.

GT: Actually, localization, some of you till now *still have some misconception about it.*

IS: Er I'd say there are some erm *misconception about* the localization.

(Interpreter 1)

In this example, the interpreter may have parallel access to the structure of the Chinese source speech expression *对...还 有 一些 误解* (duì… hái yǒu yīxiē wùjiě, about…still have some misconception) and the English structure *have some misconception about…* in the mental lexicon when producing the interpreted sentence. If the interpreter did not inhibit the structure of the Chinese source speech and followed the word order of the source speech, the ungrammatical expression *about…still have some misconception* would have been produced. However, the word order of the source speech expression was adjusted to conform to English conventionality, indicating that the interpreter may have inhibited the Chinese language system and activated the English language system. Consequently, the N+PREP collocation *misconception about* was produced.

In summary, the use of collocations in the interpreted speeches indicates that the Chinese-to-English consecutive interpreting involves the processing of two languages. According to models of language control, both Chinese and English language systems in the interpreters' cognition may have been activated in the interpreting process, competing for selection (e.g. Christoffels &

De Groot, 2009). In this process of co-activation, the Chinese mental lexicon of interpreters may interfere with the production of collocations in English, leaving traces on collocations interpreters produce. In addition to the influence of the Chinese mental lexicon, expressions in Chinese source speeches may reinforce the activation of the Chinese language system, interfering with the use of collocations in English-interpreted speeches. To avoid producing unnatural and ungrammatical collocations, trainee interpreters need to inhibit the Chinese language system, a process that may not always be fully realised during the interpreting process. As suggested by previous studies (e.g. Lamberger-Felber & Schneider, 2008), a failure to inhibit the source language system may lead to unnaturalness or grammatical mistakes in target speeches.

So far, the possible influence of the mental lexicon of trainee interpreters and the parallel activation of Chinese and English have been discussed. The next section proceeds to discuss another cognitive process involved in Chinese-to-English consecutive interpreting, i.e. working memory, and its possible correlation with the use of collocations in interpreting.

### 6.3 Working memory and the use of collocations in consecutive interpreting

In Chinese-to-English consecutive interpreting, trainee interpreters need to process multiple tasks concurrently, such as listening to and comprehending source speeches, taking notes, reading notes, recalling the source information, and formulating the interpreted speech. In addition, they need to memorise the information in source speeches for a certain length of time before conveying the information in the target language. The processing of multiple tasks and the temporary storage of information in consecutive interpreting is assumed to be conducted mainly by the working memory of interpreters (Köpke & Nespoulous, 2006; Moser-Mercer, 2000; Moser-Mercer, 2023). The central executive of working memory, according to the theoretical model proposed by Baddeley, 2009b, 2017), controls the allocation of attention, helping interpreters to divide their attention to different tasks at the same time. Other components of working memory, including the episodic buffer, the visuo-spatial sketchpad (VSSP), and the phonological loop (Baddeley, 1993), temporarily store the source information, enabling interpreters to reproduce the source information later.

Working memory, known for its limited storage and attention allocation capacity (Baddeley, 2009b), can be significantly strained during consecutive interpreting, often pushing interpreters to use working memory capacity to its fullest extent (Mizuno, 2005; Obler, 2012). This implies that trainee interpreters might frequently operate near the saturation point of working memory capacity during the interpreting process (Gile, 1995). When confronted with challenging tasks, such as recalling information stored in working memory, interpreters might be compelled to divert more attention to these more cognitively demanding tasks, consequently allocating less effort to concurrent tasks such as retrieving target language expressions from their mental lexicon. Failure to appropriately allocate cognitive resources might destabilise the concurrent processing of required tasks and impede upcoming cognitive operations. This imbalance in attention resource management can potentially have a detrimental impact on the overall quality of interpreted speeches. Moreover, the limited storage capacity of working memory, with information stored in working memory being subject to decay over time, may force interpreters to continuously face potential information loss during the interpreting process (Jin, 2011). Excessive loss of source speech information may compromise the accuracy of corresponding interpreted speeches.

Collocations are prefabricated chunks stored in the mental lexicon of language users and can be drawn directly from long-term memory without going through the process of grammar parsing, that is, constructing the surface structure of a language based on a set of lexical and syntactical rules (Sinclair, 1991; Wang, 2016). As reviewed in Section 2.1, collocations are more easily processed in language comprehension and production than non-formulaic sequences (Conklin & Schmitt, 2008, p. 72; Jiang & Nekrasova, 2007; Schmitt & Carter, 2004; Siyanova et al., 2011; Tremblay & Baayen, 2010). The generation and recognition of collocations circumvent the need for the brain to construct grammatical structures and assemble lexical items, thereby economising working memory capacity and mitigating the cognitive load of language users (e.g. Caillies & Declerq, 2011; Carrol & Conklin, 2020; Titone & Libben, 2014). In simultaneous interpreting, the use of collocations, both in source speeches and interpreted speeches, has been found to potentially alleviate working memory burdens (Plevoets & Defrancq, 2018; Van Rietvelde et al., 2010).

When it comes to this study, the use of collocations by the trainee interpreters is influenced by the cognitively demanding nature of Chinese-to-English consecutive interpreting. Interpreting shifts accompanying the occurrence of collocations in interpreted speeches indicate possible challenges brought about by the limited storage and attention allocation capacity of working memory in the interpreting process. It seems that by using collocations, the trainee interpreters were able to manage their working memory capacity efficiently, avoiding the saturation of their working memory and disfluencies in their interpreted speeches. Nevertheless, the interpreters show instances of sacrificing naturalness for the fluency and accuracy of interpreted speeches. The following sections discuss how the limited storage and attention allocation capacity of working memory may have influenced the use of collocations by the trainee interpreters in this study.

### 6.3.1 The limited storage capacity of working memory

In the interpreting corpus, there are many instances where the use of collocations seems to have helped interpreters compensate for the information loss brought about by the limited storage capacity of the working memory in the interpreting process. For instance, many addition shifts observed in the interpreting corpus were accompanied by the loss of source speech information. Such information losses may be due to the fact that interpreters did not have sufficient extra working memory capacity to store the information, or because the information had decayed when the interpreters produced their interpreted speeches. When the interpreters seemed to have difficulties retrieving source speech messages from working memory, they added collocations to fill the information gap, avoiding spending too much extra effort on recalling the source speech (Tang & Li, 2017). Example (64) illustrates how the use of collocations may have helped interpreters compensate for information loss due to the limited storage capacity of working memory.

Example (62) (reproduced from Example (31) in Subsection 5.2.1)

Source speech (SS):

我们 知道 以前啊 大部分 走的 就是 这种 传统 媒体

*wǒmen zhīdào yǐqiána dàbùfen zǒude jiùshì zhèzhǒng chuántǒng méitǐ*

We know before most followed is such traditional media

比如说 平面 广告, 以及 这种 报纸 之类的 广告。

*Bǐrúshuō píngmiàn guǎnggào, yǐjí zhèzhǒng bàozhǐ zhīlèide guǎnggào.*

such-as print ads and such newspaper kind of ads.

GT: We know that in the past, (Shuimo town) primarily used traditional media, such as print advertisements and newspapers, (to promote tourism).

IS: And in the past several years the marketing strategies of Shuimo town is= er was actually *quite simple* and we used a lot of print ads.

(Interpreter 79)

In this example, the information about *traditional media* and *newspapers* in the Chinese source speech sentence is absent in the interpreted sentence. It is possible that the information was not stored in the interpreter's working memory due to limited storage capacity because it had decayed over time in the interpreter's working memory. Another possibility is that the interpreters strategically summarised the source speech, which enables them to efficiently manage their attention.

Another type of shift, approximation, may also result from information decay in interpreters' working memory in the interpreting process. In the following example, the interpreter seems to have forgotten the element *团队* (tuánduì, teams) and uses the collocation *different things* to fill the information gap.

Example (63)

SS: 其实 我们 是 需要 *跨* *团队* 去 做 事情的。

*qíshí* *wǒmen* *shì* *xūyào* *kuà* *tuánduì* *qù* *zuò* *shìqíngde.*

Actually we are need cross *teams* to do things.

GT: *Actually, we need to work across teams.*

IS: Erm I sometimes I need to work across the *different things*.

(Interpreter 3)

The meaning of the ADJ+N collocation *different things* in the interpreted speech deviates from the meaning of *团队* (tuánduì, teams) in the source sentence. It is possible that the interpreter did

not have the storage capacity for the information element *teams*, discarding the information when listening to or noting down the source speech. Consequently, the source information *teams* is not reproduced in the interpreted speech and is substituted by the collocation *different things*. Another possibility is that the interpreter stored the information *teams* into working memory when listening to and comprehending the source speech sentence. However, when the interpreter produced the interpreted speech, this information had decayed in their working memory. As a result, a collocation that fits the context of *work across* is used to fill the gap of the lost information *teams*.

Given that only a limited amount of information can be stored in interpreters' working memory when listening to source speeches and taking notes, interpreters need to manage the information to be memorised or to be noted down as efficiently as possible (Jia & Liang, 2020). Specifically, interpreters need to memorise key information only, discarding redundant or "secondary" information in source speeches (Cox & Salaets, 2019, p.11; Viaggio, 2002). The efficient management of the storage capacity of working memory may have influenced how the interpreters made interpreting shifts with collocations in this study. As reported in Subsection 5.1.4, interpreters compressed source speech sentences or sentence segments into collocations. This compression shift may help interpreters save the storage capacity of their working memory. As illustrated in Example (36) in Subsection 5.1.4, the interpreter compresses the source speech expression *优雅的 矗立 在 整个 教堂的 呃 草地 上面* (yōuyǎde chùlì zài zhěnggè jiàotángde è cǎodì shàngmiàn, standing gracefully on the lawn of the cathedral) into a V+ADV collocation *standing there*. In this example, it seems that the key information is *standing on the lawn*. Compared with storing the whole chunk *优雅的 矗立 在 整个 教堂的 呃 草地 上面* (yōuyǎde chùlì zài zhěnggè jiàotángde è cǎodì shàngmiàn, standing gracefully on the lawn of the Cathedral) into the working memory, it seems to be more cognitively economical to compress the chunk into *站在 那儿 (standing there*), store it into working memory, and save the storage capacity for other important information, though such a rendition deviates from the meaning of the source speech.

In another example, the interpreter compresses the source speech expression, with redundant information omitted.

Example (64)

SS: …扮演　一个　*符合　某　历史　阶段的　人物*。

*...bànyǎn　yīgè　fúhé　mǒu　lìshǐ　jiēduànde　rénwù.*

…play　*a*　*fits　certain　historical　period　character*.

GT: … (and you will play) a character *from a certain historical period*.

IS: …and you= in that roleplay you will experience a particular *historical erm figure*…

(Interpreter 74)

In this example, the trainee interpreter renders the sentence segment *符合 某 历史 阶段的 人物* (fúhé mǒu lìshǐ jiēduànde rénwù, a character from a certain historical period) into an ADJ+N collocation *a historical figure*. Such a rendition is more succinct in style than the sentence segment in the source speech and clearer in meaning. The source speech expression, *符合 某 历史 阶段的 人物* (fúhé mǒu lìshǐ jiēduànde rénwù, a character from a certain historical period), is a premodifier+noun structure. Compared with storing the whole sentence segment in the working memory, it seems to be more cognitively economical to omit the secondary information *符合...阶段的* (fúhé…jiēduànde, from… period) and compress the source speech expression *into* 历史 人物 (lìshǐ rénwù, historical figure), which may save the storage capacity of the working memory. It needs to be noted that the compression of source speech sentences may either result from the conscious or the unconscious choice of interpreters (Napier, 2004, 2015). On the one hand, it is likely that the trainee interpreters strategically compressed source sentence segments with collocations to save the storage capacity of their working memory. On the other hand, they may have unconsciously selected the most efficient approach to storing and reproducing the source speech message with their working memory (Lv & Liang, 2019).

The efficient management of information stored in working memory may also explain the grammatical bias in collocations transcoded from source speeches observed in this study. As analysed in Subsection 5.2.1, compared with the other eight types of collocations, ADV+ADJ and N+N collocations include larger proportions of transcoded collocations, with 47.98% of ADV+ADJ collocations and 56.99% N+N collocations transcoded from source speeches. This may be because N+N and ADV+ADJ structures are highly congruent in Chinese and English (Ding & Reynold, 2021; Lin, 2006; Yuan & Huang, 1998). As reviewed in Subsection 2.3.2,

congruent collocations are more easily processed and are more readily recognisable for L2 English users (e.g. Yamashita & Jiang, 2010). Therefore, compared with the other types of collocation, N+N and ADV+ADJ collocations in source speeches are easier to recognise and store in the mental lexicon by trainee interpreters. Trainee interpreters may not need to go through the grammar parsing procedure (He, 2019) when reproducing the meaning of N+N and ADV+ADJ expressions in English but can draw English translations of those expressions directly from their mental lexicon. Therefore, compared with memorising the other types of collocations, transcoding N+N and ADV+ADJ collocations seems to be less cognitively demanding. In addition, as noted at the beginning of this section, there is a time lag between trainee interpreters hearing the source speech and producing the interpreted speech in Chinese-to-English consecutive interpreting. During this time lag, source speech information noted down or memorised may decay with time. Though trainee interpreters take notes to facilitate the working memory, "assistance from notetaking is also limited because only part of the information can be taken down, given the intense time constraints in the comprehension phase" (Jia & Liang, 2020, p. 9). In this regard, trainee interpreters may run a lower risk of losing information in source speeches by memorising/noting down congruent N+N and ADV+ADJ collocations that are easier to memorise and recall. As for the other structures, such as V+N and N+V structures, trainee interpreters may construct them based on the N+N and ADV+ADJ collocations noted down or memorised and the understanding of the source speech.

In addition, as delineated in Subsection 5.2.1, N+N collocations primarily serve to establish references and relay information about entities, whereas ADV+ADJ collocations predominantly express the attitudes of the language users (Biber et al.,1 999; Biber et al., 2004). It is likely that the trainee interpreters frequently transcoded N+N and ADV+ADJ collocations because these two types of collocations are regarded as core information in source speeches to interpreters and, therefore, are stored in the working memory or noted down for further reproduction. In comparison, the information encapsulated in other types of congruent expressions from the source speeches may not be as important as N+N and ADV+ADJ collocations for interpreters. Given the limited storage capacity of working memory, interpreters may primarily memorise N+N and ADV+ADJ collocations in source speeches, which enables them to reproduce the core information in these source speeches as much as possible.

It is crucial to acknowledge the role of note-taking in Chinese-to-English consecutive interpreting, particularly considering its relation to the working memory capacity of trainee interpreters. This study conceptualises notes as a supplement to working memory, aiding interpreters in the temporary storage of information from source speeches (Gile, 2009). Much like working memory, interpreters' notes are constrained in terms of storage capacity and tend to be highly fragmentary (Albl-Mikasa, 2007, p. 398). Interpreters note down chunks of information when listening to source speeches and enrich the available information by referring to non-linguistic sources, such as knowledge of the target language, background knowledge about the source speeches, and their understanding of the source speech. Therefore, in this study, it is posited that the restricted storage capacities of both working memory and notes may impact the use of collocations by interpreters when rendering source speeches.

### 6.3.2 The limited attention allocation capacity of working memory

The limited attention allocation capacity of working memory may have influenced the use of collocations in Chinese-to-English consecutive interpreting in this study, as indicated by the interpreting shifts, diversity of collocations, complexity of collocations, and unnatural collocations in the interpreted speeches. In the interpreting corpus, the occurrence of collocations was observed to have been accompanied by indicators of possible saturation of working memory capacity, such as interpreting shifts leading to semantic deviations from source speeches and disfluency markers. This indicates that the use of collocations may help interpreters ease their cognitive burden when they encounter possible risks of saturating the attention allocation capacity of working memory. In the interpreting process, the interpreters seemed to opt for a more cognitively economical approach in allocating attention to multiple tasks.

Language processing via memory is believed to require fewer cognitive resources than language processing via computation, which refers to constructing an expression via grammatical parsing (Chomsky, 1995; Pinker, 1999; He, 2019). By drawing collocations directly from notes, working memory, or long-term memory, which is equivalent to what previous scholars called language processing via memory (Chomsky, 1995; Pinker, 1999), trainee interpreters may adopt a more

cognitively economical approach to represent the concepts in source speeches. This tendency of using collocations to facilitate the economical processing of the brain and overcome cognitive overload in interpreting is observed in the present study, echoing the processing economy hypothesis of how human brains operate in monolingual and bilingual speech production, translating, and interpreting (Chomsky, 1991; Chou et al., 2016; He, 2019; Pinker, 1999). As Chou et al. (2016) noted, the operation of the brain in interpreting is conditioned by the principle of economy: in the interpreting process, interpreters who face the stress of saturating cognitive resources consciously or unconsciously choose the most effort-saving approach to allocate cognitive resources. In this study, how collocations were rendered from source speeches and used in interpreted speeches seems to reflect the tendency for economical processing in trainee interpreters' brains. The results obtained in Chapter Four and Chapter Five indicate that by using collocations, trainee interpreters may be able to ease the burden of the central executive and gain more time, during which they may allocate attention to retrieving the source speech from the working memory, reading notes, or searching for target language expressions in the mental lexicon. In addition, it seems that when the attention allocation capacity of working memory is saturated, interpreters tend to trade naturalness for fluency, as illustrated below.

***Addition***

The shift of addition observed in the interpreting corpus may be attributed to the management of the constrained attention allocation capacity of working memory (Gumul, 2017; 2020). As noted by previous studies (Bakti, 2017; Tang & Li, 2017), experiencing potentially increased cognitive load imposed by time constraints, memory load constraints, or a lack of background knowledge, trainee interpreters tend to explicitate source speeches by adding extra expressions, filling out elliptical constructions, and adding modifiers and qualifiers or other forms of text-enriching shifts to manage the allocation of cognitive resources. By using collocations, which are discovered to be processed faster than non-formulaic sequences by language users (Gibbs et al., 1997; Conklin and Schmitt, 2008), trainee interpreters may gain time to recall the source speech and search for target language expressions in their mental lexicon.

In the following example, the trainee interpreter adds an extra ADV+ADJ collocation in the interpreted speech, which lengthens the interpreted speech and seems to gain the interpreter some time to recall the source speech information and formulate the interpreted speech:

Example (65)

SS: 啊 Frank Gehry 她 有 一些 很 有趣的 绰 号,

*ā Frank Gehry tā yǒu yīxiē hěn yǒuqùde chuò hào,*

Ah Frank Gehry she has some very interesting nick name,

那 这些 绰 号 也 显现出 *她 对 作品的 一些 呃 看法*。

*nà zhèxiē chuò hào yě xiǎnxiànchū tā duì zuòpǐnde yīxiē è kànfǎ.*

so these nick names also manifest *her to works some er ideas*.

GT: Frank Gehry has some interesting nicknames that reflect some of *her ideas about architectural works*.

IS: Well actually her= there was a lot of interesting nicknames revolve around her erm which can erm symbolise her er *very interesting* er architect ideas.

(Interpreter 21)

In the source speech, the speaker does not use *very interesting* to modify *她 对 作品的 一些 看法* (tā duì zuòpǐnde yīxiē è kànfǎ, her ideas about architectural works). In the interpreted speech, the trainee interpreter adds the ADV+ADJ collocation *very interesting*. It is possible that the interpreter has forgotten whether the source speaker expressed the concept of *very interesting* in the source speech and produces such a collocation in the interpreted speech because of their limited working memory capacity. From another perspective, the interpreter may be adding an extra collocation *very interesting* to gain time to recall the source information *她 对 作品的 一些 看法* (tā duì zuòpǐnde yīxiē è kànfǎ, her idea about architectural works) or to construct an expression that can denote the meaning of *她 对 作品的 一些 看法* (tā duì zuòpǐnde yīxiē è kànfǎ, her idea about architectural works). Before and after producing *very interesting*, the trainee interpreter produces filled pauses with *er*. That may be because the trainee interpreter has reached maximum working memory capacity or has difficulties allocating attention (Plevoets & Defrancq, 2018; Tóth, 2011). It needs to be noted that the collocation *very interesting* has a t-score of 24.66, which is much higher than the threshold of high-t-score collocation (10) set by the present study. That means *very interesting* is a very common English collocation. In addition, *very interesting* is congruent in Chinese and English. As discussed in 6.2.3 and 6.2.5, trainee interpreters may be familiar with this collocation and can directly produce this collocation via what Pinker (1999) called the memory-based language processing mechanism. In doing so, the trainee interpreter may gain time to recall the source information and search for English expressions for *她 对 作品*

*的 一些 看法* (tā duì zuòpǐnde yīxiē è kànfǎ, her idea about architectural works).

Collocations are longer than single words. By rendering source speech expressions into collocations rather than single words, trainee interpreters can lengthen the interpreted speech, which may also buy them time for other tasks in target speech production. In the following example, the trainee interpreter renders a verb in the source speech into an ADJ+PREP collocation *(be) familiar with*:

Example (66)

SS: 我 想呢 大家 应该 *知道*

*wǒ xiǎngne dàjiā yīnggāi zhīdào*

I think everyone should *know*

这 一个 英国的 一个 建筑 “女 魔头”,

*zhè yīgè yīngguóde yīgè jiànzhù ‘nǚ mótóu’,*

this one British an architect “female demon”,

人 称 曲线 女王的 一个 Zaha Hadid。

*rén chēng qūxiàn nǚwángde yīgè Zaha Hadid.*

people called curve queen a Zaha Hadid.

GT: I think everyone should *know* this British architect “female demon”, who is also known as Queen of the Curve, Zaha Hadid.

IS: So I guess everyone is so *familiar with* erm this lady on the slide. She's erm called the master of curve in the U K. She's an architect and she is Zaha Hadid.

(Interpreter 55)

In this example, the trainee interpreter renders the word *知道* (zhīdào, know), which could have been interpreted into *know*, into an ADJ+PREP collocation *(be so) familiar with* in the interpreted

speech. After producing the collocation *be familiar with*, the trainee interpreter produces a filled pause: *erm*, which indicates a possibly increased cognitive load. The interpreter may have difficulty recalling the source information or encoding the source speech. By lengthening the interpreted speech expression with the collocation (*be so) familiar with*, the trainee interpreter may gain some time to allocate attention to recalling the source information or restructuring the source speech.

The above two examples illustrate that collocations may facilitate trainee interpreters in explicitating source speeches, which could be a cognitively economical approach to managing attention allocation and easing the burden of working memory. As reviewed in Chapter Two, collocations are stored in interpreters' mental lexicon as a whole chunk and occupy the same memory capacity as single words. Drawing a collocation from one's mental lexicon requires the same attention as a single word. By using a collocation instead of a single word or adding an extra collocation, trainee interpreters may lengthen the interpreted speech and gain more time to allocate attention to other tasks when producing the interpreted speech. In addition, compared with a whole sentence or a sentence segment, collocations do not carry too much extra information. It seems that adding a collocation to the source speech would not run the risk for interpreters of deviating excessively in meaning from the source speech.

***Restructuring***

As noted in Subsection 6.1.2, trainee interpreters need to restructure the surface structure of source speech expressions that cannot be translated word for word into English to ensure grammatically correct target language use, and in the process of restructuring, some collocations may be produced in interpreted speeches. As Seeber and Kerzel (2011) found, structural asymmetry between the source and the target language increases the cognitive load of interpreters in simultaneous interpreting: interpreters need to expend extra effort to adjust the word order of source speech expressions. In the present study, it remains unknown whether trainee interpreters used collocations strategically to ease the cognitive burden created by the structural asymmetry between Chinese and English or whether the collocations in the interpreted speech simply occurred due to restructuring. However, theoretically, by drawing collocations directly from the

mental lexicon, trainee interpreters may need to give less attention to the adjustment of the word order or the part of speech of words, which could be more cognitively economical.

The following example illustrates how the structural and grammatical asymmetry between Chinese and English can escalate the cognitive load on the working memory of interpreters. Furthermore, this example elucidates how the employment of collocations in interpreted speeches might help interpreters alleviate this increased cognitive burden.

Example (67)

SS: 反倒是 游戏 中的 这 种 光影 效果,

*fǎndàoshì yóuxì zhōngde zhè zhǒng guāngyǐng xiàoguǒ,*

On-the-contrary game in this kind lighting effect,

它 这个 逼真的 物理 引擎 渲染 出来,

*tā zhègè bīzhēnde wùlǐ yǐnqíng xuànrán chūlái,*

it this realistic physics engine render out,

这个 显示 效果 *比 PS4 要 好 太 多*。

*zhègè xiǎnshì xiàoguǒ bǐ PS4 yào hǎo tài duō*.

this display effect *than PS4 is better much more*.

GT: On the contrary, the light and shadow effect in the game, which is realistically rendered by the physics engine, *is much better than that of PS4*.

IS: And I do think the lighting out er the light outcome is *much better than* that of PS4.

(Interpreter 7)

The trainee interpreter restructures the ADJ+ADV pattern, *好* (ADJ) *太多* (ADV) (hǎo tài duō, much better), in the source speech to form an ADV+ADJ structure in English, namely, *much better*. This structure is then repositioned to the beginning of the sentence and linked with *显示效果* (xiǎnshì xiàoguǒ, display quality) using the verb *is*. Consequently, the collocation *(be) much better (than)* is formulated. It is possible that in the interpreting process, the trainee interpreter allocated attention to recognising the syntactic asymmetry between the source speech structure and the target language structure and made the adjustment in target speech production, which, according to Seeber and Kerzel (2011) and Ma's (2019) research, may lead to an increased

cognitive load. Another possibility is that the trainee interpreter has established what previous scholars (De Groot, 1997; He, 2019; Paradis, 1994) noted as the memory pair between the Chinese 比/bi-structure and the English ADJ+PREP structure, such as 比…好 (bǐ…hǎo, than…better) and *be better than*. When rendering the asymmetrical Chinese 比/bi-structure, the trainee interpreter may have matched the source speech structure directly with the target language in their mental lexicon, which, according to He (2019), does not require grammatical parsing in the cognitive system and is more effort-saving. In this regard, the use of the ADJ+PREP structure may facilitate trainee interpreters in managing the cognitive load caused by the structural asymmetry between Chinese and English.

***Approximation***

As noted in Subsection 5.1.4, trainee interpreters are observed to use collocations that are not accurate semantic representations of source speech expressions in interpreting. The meanings of collocations produced for approximation in the interpreting corpus deviate from the exact meanings of source speech expressions. As discussed by previous scholars (Bartlomiejczyk, 2006; Li, 2015), interpreters tend to provide a near equivalent term, a synonym, or a less precise version of a lexical item in the source speech when experiencing difficulty finding an ideal equivalent in the target language mental lexicon. As far as the trainee interpreters in the present study are concerned, when encountering difficulties finding expressions in the English mental lexicon to denote the exact meaning of source speech expressions, they may need to allocate extra attention to searching for words in the English mental lexicon. When expressions in Chinese source speeches do not have equivalents in English, interpreters may need to construct grammatical structures in English and search for words to explain concepts conveyed by the source language expression, which may also require attention. In comparison, extracting a familiar collocation directly from one's mental lexicon does not require as much attention as grammatical parsing (Chomsky, 1995; Pinker, 1999), enabling interpreters to avoid saturation of the attention allocation capacity of their working memory caused by searching for appropriate words. This method of using collocations echoes what He (2019) noted as the tendency to access cognitively less costly paths in interpreting. For trainee interpreters, drawing a collocation with an approximate meaning to the meaning of the source speech expression directly from memory seems to be less costly than constructing a structure in the target language via grammatical

parsing to precisely denote the meaning of the source speech, even though the accuracy of the interpreted speech may be impacted when approximation occurs.

In Example (33) presented in Subsection 5.1.4, the Chinese idiom *功不可没* (deserves all the credit) in the source speech, which does not have a direct translation in English, is approximated with a common collocation *good work*. However, the meaning of *good work* deviates from the source speech expression.

Example (68) (reproduced from Example (33) in Subsection 5.2.4)

| | | | | | | |
|---|---|---|---|---|---|---|
| SS: 王者荣耀 | 可以 | 有 | 如此 | 大的 | 用户 | 体量, |
| *Wángzhěróngyào* | *kěyǐ* | *yǒu* | *rúcǐ* | *dàde* | *yònghù* | *tǐliàng,* |
| Glory-of-King | can | have | such | big | user | volume, |

| | | | |
|---|---|---|---|
| 整体的 | 运营 | 推广 | *功不可没*。 |
| *zhěngtǐde* | *yùnyíng* | *tuīguǎng* | *gōngbùkěmò*. |
| entire | operation | promotion | *credit can't erase*. |

GT: The operation and promotion of Glory of King *deserve all the credit* to attract such a large volume of players.

IS: So I believe today Kings of Glory has such a big number of users can really= er is really *a good work* of its team.

(Interpreter 43)

The repetition and filled pause occurring before *a good work* indicate that the interpreter may be aware that the source message the operation and promotion (of the team) was lost and hesitated. The use of *a good work*, though deviates from the source expression in meaning, enabled the interpreter to manage the attention resource of the working memory and focus on producing the following information. Another possibility is that the trainee interpreter may have encountered difficulties in finding a target language expression for *功不可没* (gong bùkě mò, deserves all the credit). Since *功不可没* (gong bùkě mò, deserves all the credit) has no equivalent in English, to render it into English, the trainee interpreter needs to deverbalise the source speech expression and use the target language to explain the concept embedded in *功不可没* (gong bùkě mò, deserves all the credit). Compared with denoting the exact meaning of *功不可没* (gong bùkě mò,

deserves all the credit) in English via grammatical parsing, drawing a collocation with an approximate meaning directly from the mental lexicon seems to be less cognitively demanding. Therefore, it is possible that to alleviate the cognitive load and avoid allocating too much attention to constructing the target language, the interpreter produces the collocation *a good work*. Though the meaning of *good work* deviates from that of the source speech, the trainee interpreter may thus avoid the risk of cognitive saturation.

***Transcoding***

The transcoding of collocations from source speeches into interpreted speeches may also be related to the management of attention by trainee interpreters. Transcoding is regarded as one of the two mental procedures taking place in the interpreting process (Christoffels & De Groot, 2005; Darò, 1990; Massaro & Shlesinger, 1997). The other procedure, meaning-based interpreting (Dam, 1998, 2001; Liu, 2021), or interpreting proper (Christoffels & De Groot, 2005; Seleskovitch, 1975), involves the transfer of the source speech meaning, stripped from its linguistic form. As He (2019, p. 37) noted, transcoding may result from a "structure-routed" decoding and encoding of the source speech in translators'/interpreters' minds: the target language structure is constructed by following the same or similar grammatical structures of the source speech. In the present study, trainee interpreters may have followed the same route by transcoding source speech expressions, which, as Paradis (1994) noted, is accomplished with the assistance of the knowledge of the source language and target language collocation knowledge stored in the memory. Compared with monolingual speakers who deliver speeches based on conceptual preparation and grammatical encoding (Levelt, 1999), trainee interpreters have the choice to memorise source speech surface structures as whole chunks and reproduce those chunks via the structure route, which saves them allocating attention to converting source speech surface structure into conceptual memory and conveying the concepts with target language surface structures. Transcoding source speech collocations is a "short circuit" based on "automatic lexical pairings" (Paradis, 1994, p.297). It enables interpreters to quickly render a speech from the source to the target language. It is believed to require less mental effort than processing source speeches via a computation route (Lin et al., 2018).

In the following example, the trainee interpreter transcodes an expression from the source speech

and reproduces the N+N structure in the interpreted speech. By transcoding the source speech expression, the trainee interpreter may avoid allocating extra attention to adjusting the word order of the source speech expression.

Example (69)

SS: *旅游业 的 发展* 让 水墨 镇

*lǚyóuyè de fāzhǎn* *ràng* *shuǐmò* *zhèn*

*Tourism 's development* make Shuimo town

实现了 将近 50 年的 跨越 发展。

*shíxiànle* *jiāngjìn* *wǔshí* *niánde* *kuàyuè* *fāzhǎn.*

achieve around 50 years' leapfrog development.

GT: *Tourism development* has helped Shuimo town to have a leapfrog development of nearly fifty years.

IS: The tourism of the= er *the tourism development* promoted the country's= er these local areas' developments…

(Interpreter 78)

In the source speech, *旅游业 的 发展* (lǚyóuyè de fāzhǎn, tourism development) is an N+particle+N structure. The head noun *发展* (fāzhǎn, development) and the complement noun *旅游业* (lǚyóuyè, tourism) are connected by the particle *的* (de), which denotes the modifying relation between the two nouns (Simpson, 2002). The function of the modifying *的* (de) in Chinese is similar to that of *of* in English, which also indicates the modifying relation between the head noun and the complement (Huddleston & Pullum, 2005). However, the position of head nouns and complements in the structure of N+的+N in Chinese and N+of+N in English are different. In the English structure *the development of tourism*, the head noun *development* is post-modified by the complement *tourism*. In Chinese, the position of a head noun and a complement connected by the particle *的* (de) is reversed, with the head noun pre-modified by the complement, as in *旅游业* (lǚyóuyè, tourism, premodifier) 的(the particle) *发展* (fāzhǎn, development, head noun). When interpreting the N+的+N collocation from Chinese into English,

interpreters can either follow the word order of N+的+N by deleting the modifying particle *的* or switch the position of the two nouns in the source speech and renders *的* into *of*. Therefore, the source speech expression *旅游业的 发展* (lǚyóuyè de fāzhǎn, tourism development) in Example (71) can either be interpreted as *the tourism development* or the *development of tourism*.

In Example (69), when rendering *旅游业* (lǚyóuyè, tourism)*的* (de) *发展* (fāzhǎn, development), if the interpreter adjusts the word order of *发展* (fāzhǎn, development)and *旅游业* (lǚyóuyè, tourism) and produces *the development of tourism*, extra attention may need to be allocated to restructuring the source speech expression. In comparison, following the word order of the source speech expression may be less cognitively demanding: the interpreter only needs to draw the congruent collocation *the tourism development* from their working memory or mental lexicon, as Paradis (1994) suggested. The self-repair occurring before *the tourism development* in the interpreted speech indicates that the trainee interpreter may be aware of the two possible choices in rendering the source speech expression but still follows the word order of the source speech. By transcoding the source speech expression, the trainee interpreter may have selected a more effort-saving way to produce the interpreted speech.

The following example illustrates how transcoding collocations may help interpreters allocate the limited attention capacity of working memory to other tasks. In the following example, the trainee interpreter transcodes the ADV+ADJ structure but deverbalises the V+N+N expression in the source speech.

Example (70) (reproduced from Example (37) in Subsection 5.3.1)

| | | | | | |
|---|---|---|---|---|---|
| SS: 爱情 | 对 | 她 | 来说 | 太 | 重要了, |
| *àiqíng* | *duì* | *tā* | *láishuō* | *tài* | *zhòngyàole*, |
| Love | to | her | speaking-of | *too* | *important*, |
| 她 | 根本 | 就 | 不 | 在乎 | 自己的 地位。 |
| *tā* | *gēnběn* | *jiù* | *bù* | *zàihu* | *zìjǐde dìwèi*. |
| she | all | just | *don't* | *care* | *herself status*. |

GT: Love is too important to her that she doesn't care about her identity at all in the relationship.

IS: Love is *too important* for her that she even decide to er give up her status in the two people relationship.

(Interpreter 28)

The ADV+ADJ structure *太重要* (too important) in the source speech is transcoded into the interpreted speech. The interpreter could have restructured *太重要* (too important) and rendered it into expressions such as *matters a lot* or *cared much about*. However, as discussed previously, grammatical parsing is more cognitively demanding than transcoding. Restructuring the source speech expression *太重要* (too important) may require more attention than transcoding it. By transcoding the ADV+ADJ collocation, which is congruent in Chinese and English, the trainee interpreter seems to be using a more effort-saving way to produce the interpreted speech. In comparison, when rendering the V+N+Particle+N sentence segment *不在乎自己的地位* (not care about her status), the trainee interpreter restructures the source speech concept via grammatical parsing and produces *give up her status in the two people relationship*. This might be because the expression *不在乎自己的地位* (doesn't care about her status), which means *does not care about her identity in the relationship*, is vague in meaning and needs to be further clarified in the interpreted speech. It seems that to make the interpreted speech understandable, the trainee interpreter does not allocate attention to memorising the surface structure of the source speech expression but deverbalises *不在乎自己的地位* (doesn't care about her status) into a concept and expresses the concept by constructing a new structure in the target language. In this example, it is possible that by transcoding the ADV+ADJ collocation *太重要* (too important), the interpreter is able to allocate more attention to deverbalising *不在乎自己的地位* (doesn't care about her status) and clarifying the meaning of this expression in the target language.

***Compression***

The challenge imposed by the multi-tasking nature of consecutive interpreting on attention allocation of working memory may have also contributed to shifts of compression in this study. According to previous studies (Braghout et al., 2015; Gile, 2011; Mizuno, 2017; Pym, 2008), compression occurs as a consequence of a high cognitive load. To avoid the cognitive saturation caused by the high speed of source speeches (Braghout et al., 2015), to allocate attention to searching for appropriate equivalents in the target language (Gile, 2011), or to ease the burden on

the working memory (Mizuno, 2017), interpreters may compress or omit elements of source speeches. By compressing and omitting source speech sentence segments, trainee interpreters possibly saved on the attention required to memorise to recall the surface structure of source speech sentence segments from the working memory in the target speech production phase. In addition, as discussed at the beginning of Section 6.3, drawing collocations directly from the mental lexicon in the target speech production phase requires trainee interpreters to process the information via memory. Otherwise, trainee interpreters need to construct a target language structure based on the concept conveyed in the source speech via the computation process, which is more cognitively demanding than memory-based processing (He, 2019; Pinker, 1999). By drawing collocations from memory to convey the meaning of source speech sentences or sentence segments, trainee interpreters do not need to allocate attention to parsing separate items in the source speech, which can unburden the working memory and leave more capacity for other cognitive tasks (Van Rietvelde et al., 2010).

In the following example, the trainee interpreter compresses a source speech sentence segment into a collocation, accompanied by the omission of source speech information:

Example (71)

SS: 呃 另外 *AR 加 传感器 设备 这样*

*è lìngwài AR jiā chuángǎnqì shèbèi zhèyàng*

Er additionally *AR and sensor devices this*

*一个 技术的 搭配,*

*yīgè jìshùde dāpèi,*

*a technology's combination,*

他 对于 提 呃 提高 游客的 体验

*tā duìyú tí è tígāo yóukède tǐyàn*

it for im er improve tourists' experience

也 有 非常 大的 帮助。

*yě yǒu fēicháng dàde bāngzhù.*

also has very big help.

GT: And in addition, *the combination of AR and sensor technology* is of great help in improving the experience of tourists.

IS: And in addition, erm the *new technology* can also enhance the customers experience in in different ways.

(Interpreter 74)

In this example, the interpreter rendered the segment *AR 加 传感器 设备 这样 一个 技术的 搭配* (AR jiā chuángǎnqì shèbèi zhèyàng yīgè jìshùde dāpèi, the combination of AR and sensor technology) into an ADJ+N collocation *new technology*. To render the source speech sentence segment into English, the trainee interpreter needed to adjust the word order by moving *搭配* (dāpèi, the combination of) before *AR 加 传感器 设备* (AR jiā chuángǎnqì shèbèi, AR and sensor technology), which may be processed via grammar parsing/computation, requiring more attention resources of the central executive (Chomsky, 1995; Pinker, 1999). Before producing *new technology* in the interpreted speech, the trainee interpreter produces a filled pause *erm*, which suggests that the interpreter may be having difficulty processing the source speech sentence segment. This difficulty may stem from finding an appropriate expression for the source speech sentence segment or recalling the source speech information. Compared with restructuring the source speech sentence segment into *the combination of AR and sensor technology*, drawing the collocation *the new technology* directly from the mental lexicon requires less attention. In addition, by using the collocation *new technology*, which is, though, more general in meaning than the source speech segment, the trainee interpreter compensates for the information loss in the interpreting process and avoids interrupting the production of the interpreted speech. In this regard, the trainee interpreter may be using this collocation to manage the limited attention capacity of their working memory. Another explanation of this example is that the trainee interpreter may not know the English rendition of expressions in the sentence segment *AR 加 传感器 设备 这样 一个 技术的 搭配* (AR jiā chuángǎnqì shèbèi zhèyàng yīgè jìshùde dāpèi, the combination of AR and sensor technology). Suppose the interpreter allocates too much attention to searching for appropriate expressions to convey the meaning of the source speech. In this case, other concurrent tasks such as recalling other information in the source speech may be interrupted due to a lack of attention resources. As M. Baker (2007, p. 14) noted, translators tend to "opt for safe, typical patterns of the target language and shy away from creative or playful uses" in translation. It is likely that the trainee interpreter uses the collocation *new technology* to conserve attention capacity and avoid making mistakes. Both explanations suggest that in the present study, trainee interpreters tended to use collocations to manage their attention resources and opt for a

cognitively economical approach in delivering the interpreted speech.

When compressing some source speech sentence segments into collocations, the trainee interpreters deleted redundant information in the source speech, which makes the interpreted speech more concise and succinct in style, as exemplified by the following extract, which was also used in Subsection 6.3.1 to demonstrate how the use of collocations may have helped the interpreter manage the limited storage capacity of working memory.

Example (72) (reproduced from Example (64) in Subsection 6.3.1)

SS: …扮演 一个 *符合 某 历史 阶段的 人物*。

*...bànyǎn yīgè fúhé mǒu lìshǐ jiēduànde rénwù.*

…play *a fits certain historical period character*.

GT: … (and you will play) a character *from a certain historical period*.

IS: …and you= in that roleplay you will experience a particular *historical erm figure*…

(Interpreter 74)

In this example, the trainee interpreter renders the sentence segment *符合 某 历史 阶段 的 人物* (fúhé mǒu lìshǐ jiēduànde rénwù, a character from a certain historical period) into an ADJ+N collocation *a historical figure*. Such a rendition is more concise in style than the sentence segment in the source speech and clearer in meaning. The source speech expression, *符合 某 历史阶段的 人物* (fúhé mǒu lìshǐ jiēduànde rénwù, a character from a certain historical period), is a premodifier noun structure. To render this expression into English, the trainee interpreter needs to move the noun *人物* (rénwù, character) forward, which is processed via the computation route of the brain. For the trainee interpreter, it seems to be more cognitively economical to convert the source speech expression *符合 某 历史 阶段 的 人物* (fúhé mǒu lìshǐ jiēduànde rénwù, a character from a certain historical period) into a conceptual memory (Levelt, 1999) first and then draw a collocation directly from the mental lexicon to denote the concept than memorising/noting down the surface structure of the source speech segment and reconstructing it via grammatical parsing. By using the collocation *historical figure*, the trainee interpreter does not need to allocate extra attention to constructing a target language structure.

***The diversity of collocations***

The more repetitive use of collocations in interpreted speeches observed in Chapter Four may also be partially explained by the limited attention allocation capacity of working memory. It is possible that in the target speech production phase, the repeated use of collocations that are more salient in interpreters' memory helped the interpreters ease the cognitive burden imposed by multitasking. As observed by Lv and Jiang (2019), interpreted speeches produced in consecutive interpreting feature a higher degree of lexical repetitiveness than those produced in simultaneous interpreting, indicating a tendency for simplification (Ferraresi et al., 2019; Laviosa, 1998). Lv and Jiang (2019) suggested that this tendency for lexical simplification may be a product of avoiding potential threats of cognitive saturation by interpreters. To avoid allocating too much attention to searching for unfamiliar expressions in the target language and diversifying their use of collocations, interpreters may repeatedly use collocations that are more salient in their long-term memory. In the context of the present study, when converting the source speech information into the target language, in addition to searching for expressions in the English mental lexicon, and constructing the English sentences, the trainee interpreters also needed to allocate attention to recalling the source speech information from their working memory and reading notes (Gumul, 2012). In this process, interpreters may not have the capacity to allocate extra attention to diversifying their usage of collocations in interpreted speeches. In this regard, repetitively using collocations that can be easily drawn from the mental lexicon is more effort-saving than diversifying the words used in interpreted speeches.

*Be familiar with* is the most frequently recurring ADJ+PREP collocation in the interpreting corpus. Among the 94 ADJ+PREP collocations in the interpreting corpus, *be familiar with* recurs 19 times. An examination of the source speech expressions of *be familiar with* shows that this collocation was rendered from various source language expressions. That means the trainee interpreters tended to resort to *be familiar with*, which could have been substituted by other target language expressions, as the only rendition for various expressions in the source speeches. In the following three examples, the ADJ+PREP collocation *be familiar with* in the interpreted speech has different correspondences in the source speeches.

Example (73)

SS: 可是　　我　刚刚　　问　　你　有　　没有　　学　　舞蹈的,

*kěshì wǒ gānggāng wèn nǐ yǒu méiyǒu xué wǔdǎode,*

But I just ask you whether or-not *learned* dancing,

竟然 没有 举 手。

*jìngrán méiyǒu jǔ shǒu.*

surprisingly no raise hands.

GT: But just now I asked if anybody *learned* dancing, and you didn't raise your hands.

IS: Er I asked before if anybody *is familiar with* dancing and you didn't put up your hands.

(Interpreter 51)

Example (74)

SS: 但是 我 想 腾讯 游戏 大家 一定 *不 陌生*。

*dànshì wǒ xiǎng téngxùn yóuxì dàjiā yīdìng bú mòshēng.*

But I think Tencent Game you must *not unfamiliar*.

GT: But I think Tencent Game *is not new to us*.

IS: I believe that nobody will be= will not *be familiar with* the company of Tencent.

(Interpreter 40)

Example (75)

SS: 我 想呢 这些 人 大家 应该 是

*wǒ xiǎngne zhèxiē rén dàjiā yīnggāi shì*

I think these people you should be

比较 *耳 熟 能 详*的。

*bǐjiào ěr shú néng xiángde.*

relatively *ear familiar can detail*.

GT: *I think you might <u>have frequently heard about these people and can give details about them easily</u>.*

IS: I thought you will ***<u>be er familiar with</u>*** all these people.

(Interpreter 55)

In the above three Chinese source speeches, the verb *学* (xué, learn), the adjective *不陌生* (bú mòsheng, not unfamiliar), and the natural four-character expression *耳熟能详* (ěr shú néng xiángde, have frequently heard and can give details easily) are all rendered into *be familiar with*. When formulating the surface structure of the interpreted speech, the trainee interpreters had other choices, such as *have learned to*, *is not new to*, *have frequently heard about* (as provided in the translation of source sentences) but still produced the ADJ+PREP collocation, *be familiar with*, even though the meaning of the collocation deviates from that of the source speech. It is possible that during the phase of target speech production, the majority of interpreters' attention was allocated towards accurately recalling and reproducing the information conveyed in the source speeches. This could potentially leave interpreters with limited cognitive resources to diversify their use of collocations and craft less repetitive, more conventional interpreted speeches. As evidenced in the aforementioned examples, *be familiar with* seems to be the most salient collocation with the meaning of "knowing something" in trainee interpreters' mental lexicon. Compared with diversifying the use of collocations, using the familiar collocation seems to require less attention. Thus, by recurrently using the same collocation, interpreters might manage to direct their attention to other cognitively demanding tasks in the target speech production phase. As Hasselgård (2019) discovered, L2 English learners tend to recurrently use lexical bundles that they are more familiar with as their "phraseological teddy bears" (p.1). Trainee interpreters in the present study also demonstrated a tendency to repeatedly use their collocation teddy bears in target speech production, in order to facilitate more economical attention allocation during the interpreting process.

***The complexity of collocations***

Compared with L1 English speakers, the trainee interpreters used more common collocations but fewer strongly associated collocations in this study. As defined in Chapter Three, collocations with high t-score values frequently occur in L1 English and are named common collocations in

this study. High-MI-score collocations, also known as strongly associated collocations, are less frequent in L1 English but include highly associated components. The interpreters frequently produced common collocations such as *important thing, very important,* and *very interesting* in interpreted speeches. Strongly associated collocations, such as *essential element, particularly interesting, critically important,* were produced by L1 English speakers but did not occur in the interpreting corpus. Moreover, compared with trainee interpreters, L1 English users in this study alternately used strongly associated collocations and common collocations. For instance, *the difference between* in interpreted speeches was expressed as *the disparity between, a gap between,* and *a gulf between* in L1 English speeches.

The trainee interpreters seemed to be adopting a more mistake-free way to produce interpreted speeches using more common collocations and less strongly associated collocations. The limited complexity of collocation use observed in the present study has been discussed in translation studies and is explained by translators' preference for safety as a strategy in translating (M. Baker, 2004). As reviewed in Subsection 2.4.1, M. Baker (2004) noted that by using collocations that are common in the target language, translators decrease the probability of misusing expressions in the target text, which may increase the fluency of translated texts. In this process, translators may consciously or unconsciously conform to the target language norm, attempting to make their translations more acceptable to target readers. Similarly, trainee interpreters, using collocations that they are more confident with, can avoid making mistakes when producing interpreted speeches. If an inappropriate collocation is produced due to unfamiliarity, the perception of target audiences of the quality of the interpretation may be affected.

The lack of complexity of collocations In interpreted speeches can be attributed to the limited attention allocation capacity of interpreters' working memory, the processing advantage of common collocations, and the processing difficulty of strongly associated collocations. Psycholinguistic studies have shown that compared with strongly associated collocations, common collocations are generally more salient in memory and more easily retrieved from the mental lexicon, especially for L2 English speakers (Ellis et al., 2008; Tremblay and Tucker, 2011). In this study, the trainee interpreters needed to allocate attention to multiple tasks, including recalling the source information, reading and recognising notes, and searching for English expressions to convey the source information when producing the interpreted speech.

Therefore, they may not have had time to allocate extra attention to the complexity of their use of collocations and retrieve strongly associated collocations that may be less salient in their mental lexicon. Otherwise, they may have risked failing to recall the source information, creating disfluencies or even interrupting the production of the interpreted speech. Using common collocations, which occupy less processing capacity, the trainee interpreters could allocate attention to other tasks.

The use of strongly associated colocations and common collocations in simultaneous interpreting has been examined by Ferraresi and Miličević (2017). However, the results of their study differ from the findings of this study. In Ferraresi and Miličevi''s (2017) study, no significant difference in the overall frequency of highly natural and common collocations was observed between Italian interpreting products in English (L2)-to-Italian (L1) simultaneous interpretation and Italian non-interpreted speeches. Ferraresi and Miličević (2017, p. 23) proposed that Italian-interpreted speeches and non-interpreted speeches may be less clear-cut regarding the naturalness of collocations. The difference between the finding of Ferraresi and Miličevi''s (2017) study and the present study may be due to the language pairs examined. Scholars have proposed that the structural difference between the source and the target language may influence the interpreting performance. Such an influence can be language-pair-specific (Gile, 2011; Seeber, 2007; Wang & Gu, 2016). With respect to the present study, it is likely that compared with English and Italian, Chinese and English have less in common regarding their surface structure. To convert between Chinese and English, trainee interpreters in the present study may need to allocate extra attention to restructuring the source speech expression, occupying their cognitive capacity and inhibiting the production of highly natural collocations in the target language. Regarding English–Italian interpretation, it may be less cognitively demanding for interpreters to restructure the source speech, which may have saved interpreters the attention resources to manage the complexity of target language collocations. In addition, interpreters in Ferraresi and Miličević's (2017) study worked from L2 to L1, a process in which they were less likely to encounter constraints imposed by their L1 mental lexicon. In comparison, the present study focuses on L1 to L2 interpretation. When interpreting into English, Chinese-speaking interpreters are likely to be restricted by their limited L2 mental lexicon, potentially encountering an increased cognitive load in constructing the target language. As a result, interpreters in the present study used collocations in a less

complex manner than L1 English speakers, whereas no such discrepancy between Italian interpreters and other L1 Italian speakers was observed in Ferraresi and Miličević's (2017) study.

***Unnatural collocations***

The preceding two sections have broached two potential reasons for the occurrence of unnatural collocations in interpreted speeches. Subsection 6.1.2 posits that interpreters may generate unnatural collocations due to the absence of the correct forms of those collocations in their English mental lexicon. Meanwhile, Section 6.2 attributes the use of unnatural collocations in interpreted speeches to the parallel activation of Chinese and English and the resultant interference from Chinese expressions entrenched in the interpreter'' mental lexicon. These explanations have their foundation in theories of the memory and language processing of L2 English learners.

However, the process of target speech production in Chinese-to-English consecutive interpreting is arguably more challenging for the interpreter'' attention allocation capacity within working memory compared with L2 English production by L2 English learners. This is because, while producing interpreted speeches in consecutive interpreting, interpreters need to juggle multiple tasks concurrently (as has been discussed in this section), all of which necessitate the allocation of attention resources. In contrast, L2 English learners are primarily concerned with converting concepts into English surface structures and producing English. Therefore, it is conceivable that alongside the influence of mental lexicon and language control, the cognitively demanding nature of consecutive interpreting, particularly its impact on attention allocation, may also play a role in the production of unnatural collocations in the interpreted speeches.

In Subsection 5.2.4, shifts accompanying the occurrence of unnatural collocations reflect the possible influence of the limited attention allocation capacity of interpreters' working memory on the naturalness of collocations in interpreted speeches. Example (59) presented in Subsection 5.2.4 illustrates such an influence.

Example (76) (reproduced from Example (58) in Subsection 5.3.4)

SS: 然后 第三个 是 就是 这个 文化上,

*ránhòu dìsāngè shì jiùshì zhègè wénhuàshàng,*

Then third is is this culture,

因为 你 之前 能够 借鉴的

*yīnwèi nǐ zhīqián nénggòu jièjiànde*

because you previously can refer-to

这些 科幻 电影 大部分 都是 西方的,

*zhèxiē kēhuàn diànyǐng dàbùfen dōushì xīfāngde.*

these sci-fi motives most are Western.

他们 文化 跟 我们 这个 东方的

*tāmen wénhuà gēn women zhègè dōngfāngde*

Their culture and our this Eastern

文化 相通性 比较 少。

*wénhuà xiāngtōngxìng bǐjiào shǎo.*

culture commonality relatively less.

GT: And the third (difficulty) lies in the culture (difference). Because most sci-fi movies that we can refer to are produced by Western countries whose culture does not share many common features with ours.

IS: And culture is also er *forming difficulties* for us because Western sci-fi is have a cultural background that is difficult to be learned by our oriental counterparts.

(Interpreter 61)

In the source sentence, the speaker intends to convey that the third difficulty of making sci-fi movies *lies in the culture difference*. Since the first two difficulties have been introduced previously, the speaker omits the information of *difficulty* in the source sentence. If the interpreter follows the source speech, the interpreted speech may be semantically vague/incomplete. To clarify the source speec''s intended meaning, the interpreter adds an unnatural collocation, *forming difficulties*, in the target sentence. It can be surmised that while integrating this collocation, the interpreter may have concentrated more attention on recalling and deciphering the source speec''s implicit meaning and seeking suitable target language expressions to convey the speake''s intended meaning accurately. Given the limited attention capacity of working

memory, the interpreter may not have been able to allocate additional focus to ensure the naturalness of the collocation used, producing an unnatural collocation. This suggests that the accuracy and semantic completeness of interpreted speeches may take precedence over their naturalness in Chinese-to-English consecutive interpreting conducted by trainee interpreters. To manage the risks of saturating the working memory, the trainee interpreters may have consciously or unconsciously compromised on naturalness to ensure interpreted speeche'' semantic completeness and fluency.

### 6.4 The collective influence of the mental lexicon, the co-activation of two language systems, and working memory

Based on the discussion in previous sections, this study argues that in Chinese-to-English consecutive interpreting, Chinese-speaking trainee interpreters are influenced by mental lexicon, the parallel activation of Chinese and English language systems, and the limited capacity of working memory in their target language production, with the use of collocations embodying features distinct from collocations in L1 English. The following diagram shows the collective influence of the three cognitive mechanisms on trainee interpreters' use of collocations in consecutive interpreting (Figure 6.1).

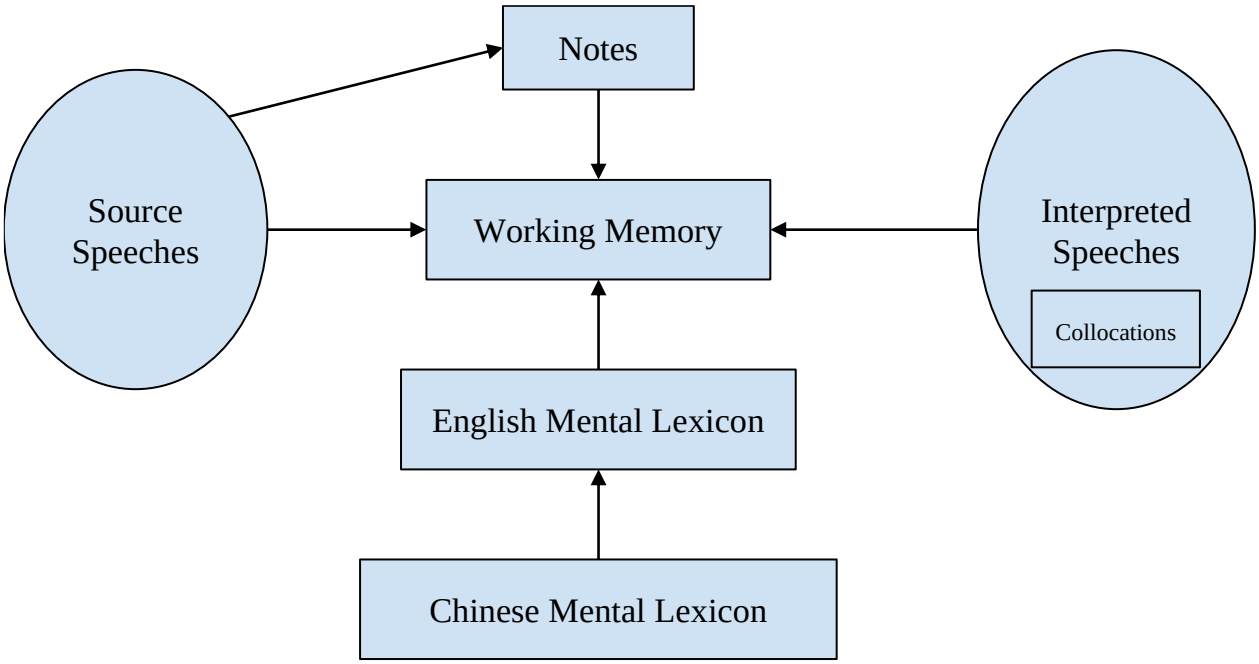



Figure 6.1 Cognitive processes in Chinese-to-English consecutive interpreting

This diagram uses arrows to denote the information flow during the interpreting process. As shown in Figure 6.1, the circle marked “Source Speeches” on the left is linked with the two rectangles, “Notes” and “Working Memory”, with two arrows. This means upon hearing the source speeches, interpreters are postulated to temporarily store the content –either as meaning or surface structures of expressions – in the working memory and notes, both of which have limited storage capacities (Baddeley, 2007; Cowan, 2005; Mizuno, 2005). “Working Memory” in Figure 6.1 is further linked to the “Interpreted Speeches” circle on the right with an arrow, meaning that when source speakers stop speaking, interpreters begin to deliver interpreted speeches based on the information stored in the working memory in the source speech listening phase. Throughout this process, the central executive of the working memory controls attention attributed to different tasks such as recalling source speeches, reading notes, and constructing the surface structure of interpreted speeches. Meanwhile, working memory oversees the extraction of collocations from the English mental lexicon, which is a part of the long-term memory, of interpreters. If interpreters encounter difficulties in efficiently allocating attention to different tasks and face risks of saturating their working memory during the target speech production phase, they may consciously or unconsciously use collocations (either natural or unnatural) to aid in managing the attention allocation. This choice aligns with the processing advantage of collocations in language production, as previous studies have revealed (Conklin & Schmitt, 2008, p. 72; Conklin & van Heuven, 2011; Jiang & Nekrasova, 2007; Schmitt & Carter, 2004; Siyanova, Tremblay & Baayen, 2010). Besides managing attention allocation, the use of collocations may assist interpreters in compensating for information loss that may occur due to the limited storage capacity of working memory.

When drawing collocations from the English mental lexicon during the target speech production phase, interpreters may be influenced by collocations and other lexical combinations stored in the English and Chinese mental lexicon. Specifically, as shown in Figure 6.1, the rectangle representing the English mental lexicon is depicted as smaller than that representing the Chinese mental lexicon, an assumption grounded in the RHM model of late bilinguals’ mental lexicon (Kroll & Stewart, 1994). This means trainee interpreters may be influenced by the possible limited number of collocations stored in their English mental lexicon in producing interpreted speeches. The features of collocations in interpreters’ English mental lexicon may also influence how they produce collocations in interpreted speeches. Further, the arrow from the Chinese

mental lexicon to the English mental lexicon means that the use of collocations by trainee interpreters could be influenced by the co-activated Chinese mental lexicon in the interpreting process, as the theories of language control in interpreting suggest (Christoffels & De Groot, 2005; De Groot & Christoffels, 2006; Dong & Li, 2020).

Figure 6.1 is useful in explaining typical collocation features of interpreted speeches. As reviewed in Subsection 2.4.2 and 2.4.3, previous studies have provided several explanations for typical collocation features of translated texts and interpreted speeches (Dayter, 2019; Ferraresi and Miličević; 2017; Marco, 2009). It is argued that the use of collocations in translated texts and interpreted speeches may be influenced by expressions in source speeches (Dayter, 2019; Ferraresi & Miličević, 2017) and the similarities and differences between the source and the target language (Dayter, 2019; Ferraresi & Miličević; 2017; Marco, 2009). The current study suggests that these factors appear to pertain primarily to the process of language control in translation and interpreting, as the dual language systems used by interpreters are co-activated, thereby inviting potential interference from source speech expressions, especially those lacking direct English equivalents. It is notable, however, that past research seems to have overlooked the potential influence of source language expressions in interpreters' mental lexicon on the use of target language collocations. Ferraresi and Miličević (2017) suggested that the cognitive load imposed by the interpreting process itself may also influence the use of collocations in interpreting. However, the two researchers did not specify how the cognitive load influences the interpreting process and the use of collocations. The model proposed by the present study (Figure 6.2) suggests that the cognitive load is primarily imposed on interpreters' working memory and subsequently influences the use of collocations in interpreted speeches. Additionally, the potential influence of interpreters' mental lexicon, should not be ruled out when explaining typical collocation features in interpreted speeches. A constrained number of English collocations stored in interpreters' mental lexicon, as well as features of those collocations, may also influence interpreters' use of collocations.

When it comes to typical collocation features of interpreted speeches observed in this study, it is likely that these features are shaped by the three cognitive processes collectively (Figure 6.2).

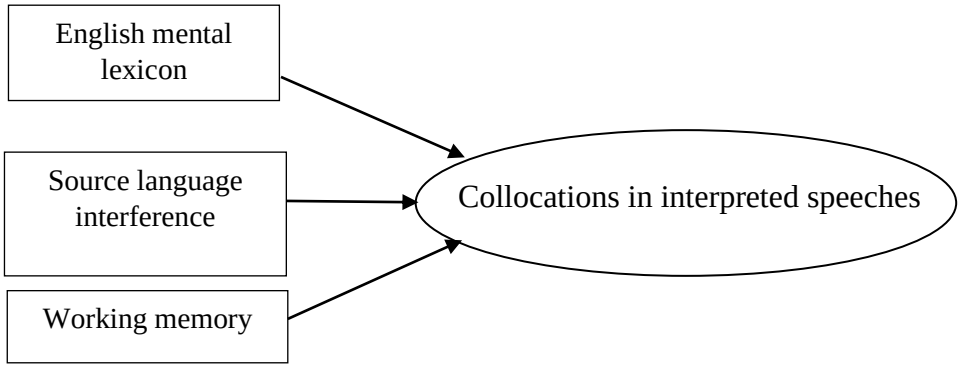



Figure 6.2 Cognitive processes influencing the use of collocations in Chinese-to-English consecutive interpreting

The three cognitive processes – the English mental lexicon, the interference of the source language at textual and mental level, and working memory – are represented by the three rectangles in Figure 6.2, and the circle symbolises the use of collocations in interpreted speeches. The three arrows in the figure signify the influential relationship that these cognitive processes exert on the employment of collocations in interpreted speeches. Typical collocation features observed in this study can be elucidated through the representation provided in Figure 6.2. Specifically, the less frequent occurrence of V+N, ADJ+N, N+V, V+ADV, and V+PREP collocations in interpreted speeches than in L1 English speeches may be due to the reason that compared with L1 English speakers, trainee interpreters have fewer collocations stored in their English mental lexicon. The more frequent occurrence of the other five types of collocations, i.e. N+N, ADV+ADJ, N+PREP, ADJ+PREP, and PREP+N collocations, may be related to the interference from the source language and the burden of working memory of interpreters. As analysed in Subsection 5.2.1, many N+N and ADV+ADJ collocations were transcoded from source speeches by the trainee interpreters, which may have led to the overuse of those two types of collocations. The frequent transcoding of these two types of collocations, as discussed in Section 6.3, may be associated with the limited storage capacity of working memory and the limited attentional resources of working memory. In transcoding congruent N+N and ADV+ADJ collocations, which are more easily recognised and memorised and entail the core information of source speeches, interpreters can efficiently manage the capacity of working memory in the interpreting process. When it comes to ADJ+PREP and PREP+N collocations, the overproduction of those two types seems to be related to the restructuring of grammatically and structurally

asymmetrical expressions in source speeches, which reflects interpreters' successful inhibition of the interference of the Chinese language system. As for the more frequent use of PREP+N collocations, interpreters frequently added PREP+N collocations that did not occur in source speeches, such as *in terms of*, *in fact*, *for people*, for *everybody*, which seem to have helped interpreters fill the gap of information loss in the interpreting process and manage the allocation of attention efficiently in the interpreting process. In this regard, the overuse of PREP+N collocations may be explained by the efficient management of working memory capacity in the interpreting process.

Regarding the less diverse use of collocations in interpreted speeches, particularly N+N and N+PREP collocations, interpreters may have a limited range of collocations stored in their English mental lexicon and therefore repeatedly employ certain collocations in the interpreting process. In addition, as discussed in Section 6.3, interpreters may not have sufficient extra attention to diversify their use of collocations or may not be aware of diversifying the use of collocations. By repetitively using collocations that are more salient in their mental lexicon, interpreters may allocate their attention to other tasks such as recalling source information and reading notes. Therefore, it is likely that collocations stored in interpreters' mental lexicon and the limited capacity of interpreters' working memory have both influenced the diversity of collocations in interpreted speeches.

The complexity of collocations in interpreted speeches may have also been influenced by the mental lexicon and working memory of interpreters. It is plausible that interpreter'' English mental lexicon includes more commonly used and less strongly associated collocations. Consequently, a larger ratio of common collocations, contrasted with a smaller ratio of strongly associated collocations, are produced by interpreters compared with L1 English speakers. This results in the relative simplicity of interpreted speeches in terms of their collocational complexity. Further, the limited capacity of working memory for attention allocation impedes interpreter'' ability to pay additional attention to the complexity of their collocation use. Therefore, under the cognitive burden imposed by multiple tasks during the target speech production phase, interpreters may use common collocations that are more salient in their mental lexicon, saving their attention resources.

Regarding unnatural collocations, the interplay of the mental lexicon of interpreters, the co-activation of Chinese and English language systems in interpreters' mental lexicon, and the limited capacity of working memory may collectively account for their manifestation in interpreted speeches. As discussed in Subsection 6.1.1, a large portion of unnatural collocations in interpreted speeches manifest as the disintegration of the association between components of natural English collocations. This suggests that interpreters may tend to memorise individual English words rather than collocations when learning English. Consequently, they may have fewer collocations than individual words stored in their English mental lexicon and tend to combine words when producing English-interpreted speeches, being unaware of the comparability of those words. Moreover, many unnatural collocations in interpreted speeches can be traced back to Chinese expressions, some of which occurred in source speeches, whereas others did not. This implies that the production of collocations by trainee interpreters may have been influenced by Chinese expressions in source speeches and the Chinese mental lexicon of interpreters, as expounded by theories of language control in interpreting. Furthermore, examining interpreting shifts, this study observed that the naturalness of collocation usage seems to be sacrificed at times to ensure the semantic completeness and fluency of interpreted speeches. For instance, the use of unnatural collocations compensated for information loss during the interpreting process, approximated the meaning of source speech expressions that required grammatical parsing when translating into English, and enabled interpreters to compress source speech sentences or sentence segments. It seems that when encountering processing challenges, such as recalling source information and finding target language expressions to convey the meaning of source speech expressions, interpreters do not possess the additional attentional capacity to pay attention to the naturalness of their collocation use. Consequently, unnatural collocations may be produced.

# Chapter Seven. Conclusion

This chapter commences with a summary of the major findings from Chapters Four and Five (Section 7.1) and proceeds to discuss the implications and contributions of the present study (Sect. 7.2). The limitations of the study are acknowledged in Section 7.3, followed by recommendations for future research in Section 7.4.

## 7.1 Major findings

The use of collocations in L2 English production facilitates the comprehension of target audiences (Schmitt, 2012; Wray & Perkin, 2000), making the production natural (Biber et al. 1999; Wray, 2002) and fluent (De Jong, 2016; Uchihara & Saito, 2019). The present study starts with the aim of exploring how Chinese-speaking trainee interpreters use collocations in Chinese-to-English consecutive interpreting. Specifically, it aims to uncover whether the use of collocations in English-interpreted speeches conforms to English conventions. Additionally, this study is interested in finding out how the interpreting process has influenced the use of collocations by trainee interpreters. Employing a corpus-based approach (Bernardini, 2007; Toury, 1995), the comparative analysis of interpreted speeches with non-interpreted L1 English and Chinese source speeches answers the overarching research question.

In this study, a collocation profile of the interpreted speeches was compiled. Generally, compared with L1 English speeches, the interpreted speeches were less collocationally conventional in frequency, diversity, and complexity. However, mixed results emerged among the ten types of collocations examined. V+N, ADJ+N, N+V, V+ADV, and V+PREP collocations occur less frequently in the interpreting corpus while N+N, ADV+ADJ, N+PREP, ADJ+PREP, PREP+N were produced more frequently by the trainee interpreters. In addition, the trainee interpreters showed a significantly higher degree of repetitiveness than English speakers when using N+N and N+PREP collocations. However, regarding the diversity of the other eight types of collocations, no significant difference was observed across the interpreting and the non-interpreting corpora. As for the complexity of collocations, trainee interpreters made use of significantly smaller proportions of strongly associated V+PREP, ADJ+N, ADV+ADJ, and N+N collocations and a larger proportion of V+ADV and ADV+ADJ collocations than L1 English speakers. In addition, interpreters combined some words based on their meanings only, though

those words do not habitually co-occur in English, which led to the occurrence of unnatural collocations in interpreted speeches.

A further investigation of Chinese literal translations of collocations in the interpreted speeches uncovered that interpreters made use of congruent collocations in producing target speeches and many unnatural collocations were rendered word for word from Chinese expressions in source speeches or in interpreters' mental lexicon. In addition, the comparison of source and target speeches reveals five types of interpreting shifts accompanying the use of collocations, namely, transcoding, restructuring, addition, approximation, and compression. These interpreting shifts indicate that the trainee interpreters seemed to be using collocations in a way that helped them unburden their working memory. These five types of shifts help explain typical collocation features that distinguish interpreted speeches from L1 English. In particular, frequent transcoding from source speeches may explain the more frequent production of the N+N and ADV+ADJ collocations in interpreted speeches than in L1 English speeches. A large proportion of ADJ+PREP and N+PREP collocations occurred as the result of the restructuring of source speeches, which may have contributed to the higher frequency of these two types of collocation in the interpreted speeches. Additionally, a substantial number of PREP+N collocations were added by interpreters, contributing to the prevalence of PREP+N collocations in the interpreted speeches. Regarding collocation diversity and complexity, the transcoding of recurrent expressions in source speeches, the repeated use of certain collocations, especially common collocations, for approximation, restructuring, and addition, and the potential loss of strongly associated technical terms during the interpreting process may have contributed to increased repetitiveness and reduced complexity in collocation use. Furthermore, the occurrence of unnatural collocations in the interpreted speeches coincided with the five types of interpreting shifts, especially transcoding and approximation. The trainee interpreters rendered unnatural collocations that were found to be word-for-word translations of source expressions. Some unnatural collocations were used when interpreters had difficulties finding equivalents of source expressions. Instead, they used unnatural collocations to approximate the meaning of source expressions.

In the specific context of this study, the use of English collocations by Chinese-speaking trainee interpreters in the interpreting process may have been restricted by multiple cognitive processes, including the mental lexicon of the trainee interpreters, the co-activation of Chinese and English language systems in the interpreting process, and the limited capacity of the interpreter'' working memory. Restricted by the English collocations stored in their mental lexicon, the trainee interpreters produced collocations in a less conventional manner than L1 English speakers. With a possibly limited number of collocations stored in their mental lexicon, which is assumed as an inherent feature of the L2 mental lexicon of even highly proficient L2 English speakers in theories of mental lexicon (Langacker, 1987; Kroll and Stewart, 1994), the trainee interpreters in this study used collocations, particularly, A+N, N+V, V+ADV, V+…+N, and V+PREP collocations, less frequently than L1 English speakers in this study. Additionally, the lack of diversity of collocations in interpreted speeches may be because the interpreters had a limited range of collocations stored in their mental lexicon and could not diversify their use of collocations in interpreted speeches. The Chinese and English mental lexicon of the interpreters seems to have also influenced the complexity of collocations in their interpreted speeches. According to the theory of the frequency effect of L2 collocation acquisition (Bybee, 2007; Bybee & Hopper, 2001), trainee interpreters possibly have less strongly associated collocations but more common collocations stored in the English mental lexicon than L1 English speakers. Consequently, when producing interpreted speeches, the interpreters used a larger proportion of common collocations and a smaller proportion of strongly associated collocations than L1 English speakers, which made the interpreted speeches less collocationally complex than L1 English speeches. The occurrence of unnatural collocations in interpreted speeches can also be partially attributed to the influence of interpreter'' mental lexicon. It seems that due to the weak association between words stored in the interpreter'' mental lexicon, they substituted components of natural English collocations with their synonyms, inverted components of natural collocations, omitted components of natural collocations, and added extra components to natural collocations, which influenced the naturalness of the interpreted speeches.

In addition to mental lexicon, the parallel activation of Chinese and English language systems in the interpreting process, may have also influenced the use of collocations by the trainee interpreters. Theoretically, both the Chinese and English language systems of interpreters are activated in the interpreting process (Colomé, 2001; Starreveld et al., 2014; Thierry & Wu, 2007).

To reproduce the meaning of Chinese source speeches in English and avoid interference from the source language, interpreters need to inhibit the Chinese language system and activate the English system when producing interpreted speeches (Green, 1998; Paradis, 2004). In this study, around half of the ADJ+PREP and N+PREP collocations were produced when interpreters restructured source speech expressions that cannot be rendered word for word into English. The restructuring shifts occurred mainly due to the grammatical and structural differences between Chinese and English, which require interpreters to inhibit the Chinese language system and activate the English language system. Though the interpreters showed instances of successfully inhibiting the Chinese system when producing some collocations, their production of some unnatural collocations indicates the interference of the Chinese language system. The interpreters produced unnatural collocations that can be traced back to natural Chinese expressions, some of which occurred in source speeches, whereas others did not. This indicates the interference from the language not in use proposed in theories of language control in interpreting (Christoffels & De Groot, 2005; De Groot & Christoffels, 2006; Dong & Li, 2020).

The way the trainee interpreters used collocations in this study can also be associated with the limited storage and attention allocation capacity of interpreter'' working memory (Baddeley, 2009b) and the fact that interpreters frequently operate near the saturation point of working memory during consecutive interpreting (Gile, 1995; Mizuno, 2005). When interpreters face potential risks of saturating the working memory capacity, the use of collocations seems to help them efficiently manage the cognitive resources of the working memory, ensuring the fluent production of interpreted speeches. For instance, the interpreters in this study added collocations in interpreted speeches, which filled the gap left by the loss of source speech information or saved the attention needed for recalling the source information. In addition, by using collocations that are near equivalents or less precise versions of source speech expressions, interpreters filled the gap in the source information and saved the attention that would otherwise be allocated to searching for an appropriate expression for Chinese expressions that may not have equivalents in English. Approximating source speech expressions with collocations seems to have guaranteed fluency but sacrificed the accuracy of interpreted speeches. Furthermore, some collocations occurred due to the compression of source speech sentence segments or sentences. This may enable interpreters to save the storage capacity of the working memory and the attention required to memorise and recall the surface structure of source speech sentence segments from the

working memory. Some collocations in the interpreted speeches were transcoded from source speeches, a process which requires fewer cognitive resources than constructing the surface structure in English via grammatical parsing to reproduce the meaning of source speech expressions (Lin et al., 2018; Paradis, 1994). Additionally, the use of collocations may have facilitated the interpreters in restructuring source speech expressions. By drawing collocations directly from their mental lexicon, the trainee interpreters could allocate less attention to the adjustment of the word order or the part of speech of source speeches, which is more cognitively economical.

The trainee interpreters in this study used collocations in a way that helped them efficiently manage their working memory capacity, which explains typical collocation features observed in the interpreting corpus. For instance, given that only a limited amount of information can be stored in interpreter'' working memory at one time (Baddeley, 2009b; Baddeley, 2017), transcoding collocations that carry the core formation of source speeches enables interpreters to reproduce source speech information as accurately and completely as possible. This explains why around half of the N+N and ADV+ADJ collocations, which occurred more frequently in interpreted speeches than in L1 English speeches, were transcoded from source speeches. In addition, interpreters frequently added PREP+N collocations in interpreted speeches, which compensated for the information loss in the interpreting process and seemed to have conserved the attention resources of interpreters. The limited capacity of working memory may also explain the lack of diversity and complexity of collocations in the interpreted speeches. In the interpreting process, interpreters may not pay extra attention to diversifying their collocations and using more strongly associated collocations. By repetitively using a small range of collocations and common collocations that are salient in the mental lexicon, interpreters may save attentional resources and allocate attention to other tasks, such as recalling source information and reading notes. The limited capacity of the working memory of the interpreters in the study may have also contributed to the occurrence of unnatural collocations in the interpreted speeches. Encountering difficulties in the interpreting process, such as formulating appropriate expressions to accurately convey the meaning of source speeches, the interpreters may not have had sufficient attentional resources to consider the compatibility of words and were only able to combine words based on the meaning of each word. Consequently, unnatural collocations were produced.

In sum, this study argues that the trainee interpreter'' use of collocations in Chinese-to-English consecutive interpreting is under the collective influence of three cognitive processes: interpreter'' English mental lexicon, the parallel processing of Chinese and English, and the limited working memory capacity. Constrained by these cognitive processes, trainee interpreters may employ collocations in a manner that diverges from L1 English speakers. This deviation manifested itself in the interpreted speeches through distinctive collocation features.

### 7.2 Implications and contributions

This study is of theoretical and pedagogical value. In general, the investigation and research findings highlight the importance of collocations in interpreting research and interpreter training, contributing to the research area of linguistic features of interpreted speeches.

First, this study contributes to the discussion and exploration of *intepretese*, i.e. linguistic features that distinguish interpreted speeches from unmediated language or potential universal features of interpreted speeches (Shlesinger & Ordan, 2012; Sinclair, 1991). The comparison of interpreted and L1 English speeches, along with the analysis of naturalness of collocations, as summarised above, yields evidence that could be considered *interpretese*. For instance, interpreted speeches in this study exhibit simpler collocation usage than L1 English speeches. Using a greater percentage of common collocations and being more repetitive in collocation usages, the trainee interpreters showed a trend towards simplification, which is postulated as a form of *interpretese* (Bernardini et al., 2016, Lv & Jiang, 2019). Shifts detected in the parallel corpus reflect the tendency of simplification, as the interpreters reduced redundancies in source speeches and compressed source speech sentences and sentence segments into collocations. Furthermore, the shift of addition observed in the parallel corpus reflects the tendency of explicitation (Hansen-Schirra et al., 2007; Feng et al., 2018). By incorporating additional collocations, the trainee interpreters made the meaning of source speeches more explicit in interpreted speeches. This study's findings partially substantiate the overall more simplified and explicit characteristics of interpreted speeches.

Second, this study contributes theoretically to the understanding of consecutive interpreting by explaining findings from a cognitive perspective. Despite the evidence of *interpretese*, mixed results derived from various types of collocations in this study imply that the choice of parameters when exploring potential *interpretese* could influence the conclusion drawn, and not all findings can be simply explained by the hypothesis of *interpretese* (Evert and Neumann, 2017). This study, in contrast with previous studies on collocation features of interpreted and translated language (Dayter, 2019; Feng et al., 2018), draws on theories of late bilinguals' mental lexicon, language control in interpreting, and the theory of working memory in psychology to explain its findings. Instead of describing typical collocation features of interpreted speeches as the potential universal features of interpreted speeches, this study suggests that multiple cognitive processes of the trainee interpreters constrain the use of collocations in Chinese-to-English consecutive interpreting. This explanation provides insights into the nature of consecutive interpreting. Based on the empirical results and findings of this study, it can posit that consecutive interpreting imposes a heavy burden on interpreter'' working memory, lending support to existing theories that view interpreting as involving language control (Christoffels & De Groot, 2005; De Groot & Christoffels, 2006; Dong & Li, 2020). Further, the findings obtained from this study deepen the understanding of the mechanism of language control in interpreting. As observed in this study, unnatural collocations in interpreted speeches indicate that the trainee interpreters may not have successfully inhibited the unintended language all the time. This means interpreters may constantly face interference from expressions in source speeches and source language expressions stored in their mental lexicon in the interpreting process, which influences the interpreting production. In addition, this study expands the notion of language control in interpreting by proposing that apart from the online processing of two languages, the mental lexicon of interpreters may also play roles in shaping interpreting production.

In addition to shedding light on the nature of interpreting, this study enhances the understanding of the role of collocations in interpreting, which is an emerging area of research in interpreting studies (cf. Eyckmans, 2007; Plevoets & Defrancq, 2018; Van Rietvelde et al., 2010). Earlier studies have shown that the use of formulaic sequences, i.e. routinised lexical chunks including but not limited to collocations, in interpreted speeches increases interpreters' fluency and reduces their cognitive burden in simultaneous interpreting (Plevoets & Defrancq, 2018). Drawing on the theory of working memory, this study further clarifies that cognitive burden is mainly imposed on

interpreter'' working memory. In addition, by investigating interpreting shifts accompanying the use of collocations in interpreted speeches, this study provides empirical evidence to existing studies. Further, it reveals how the use of collocations in the interpreting process may ease the cognitive burden of interpreters. By employing collocations, trainee interpreters achieve various linguistic shifts in a more cognitively efficient manner when generating interpreted speeches.

Although the findings of this study are based on trainee interpreter'' productions in Chinese-to-English consecutive interpreting, they may shed light on the investigation of professional interpreter'' products in other modes of interpreting and other language pairs. These valuable insights also enhance the understanding of how interpreters handle various challenges in diverse linguistic and cultural contexts. The theoretical approach taken by this study can also be adopted to explain other potentially unique features of interpreted speeches, such as explicitation and simplification revealed by existing studies (e.g. Gumul, 2020; Ferraresi et al., 2018).

In addition to the theoretical contribution, this study offers valuable insights into the pedagogical value of collocations in interpreter training. The findings indicate that interpreted speeches are less conventionally collocational than L1 English speeches. The Chinese-speaking trainee interpreters in this study tended to use single words rather than making use of collocations in interpreted speeches, which may have influenced the naturalness and the linguistic acceptability of the interpreted speeches. Thus, it would be useful if trainee interpreters were trained to pay special attention to the naturalness of their use of target language and to improve the naturalness by making use of collocations in training. Beyond the naturalness of interpreted speeches, trainee interpreters need to be made aware of the importance of collocations in easing the burden of working memory in the interpreting process. Pedagogical strategies should be employed to guide trainee interpreters to effectively manage their limited working memory capacity by using collocations.

Since the use of collocations in interpreted speeches is constrained by the mental lexicon of interpreters, the findings of this study also imply that to make English-interpreted speeches more natural and fluent, Chinese-speaking trainee interpreters need to store more English collocations,

especially the five types of underproduced English collocations revealed in the present study, i.e. V+N, ADJ+N, N+V, V+ADV, and V+PREP, in the mental lexicon. This would boost the number of collocations interpreters produce in interpreted speeches, thus improving the naturalness and fluency of their speeches. Moreover, trainee interpreters need to receive training to enhance their ability to memorise a larger range of collocations and diversify their use of collocations in interpreting production, which would make the interpreted speeches less repetitive. Given that interpreted speeches were found to be less collocationally complex in this study, it may also be useful to train interpreters to memorise more strongly associated collocations in the mental lexicon, which will improve the complexity of collocations in interpreted speeches.

Furthermore, it is worth raising Chinese-speaking trainee interpreter'' awareness of unnatural collocations they may produce in English-interpreted speeches and possible reasons for their unusualness. The trainee interpreters in this study tended to combine words based on their meanings instead of compatibility. In addition, some unnatural collocations were translated word for word from Chinese expressions. Therefore, interpreters may need to be trained to memorise English lexical combinations as whole chunks and distinguish among semantically related words, delexical verbs, and prepositions when memorising collocations, which is agreed to be the most effective way of fostering L2 collocational knowledge in SLA studies (cf. Boers et al., 2017). Special attention needs to be paid to V+N collocations, which were revealed as the most error-prone type of collocation in the interpreting corpus. Furthermore, interpreters need to be made aware of the influence of Chinese expressions in source speeches and those stored in their mental lexicon on their use of collocations in interpreted speeches. It is also necessary to teach interpreters to consider the linguistic acceptability of collocations they produce when transcoding source speech expressions into the target language.

Since the interpreted speeches in this study demonstrate collocation features of L2 English, the language teaching and learning methodology of Teaching English to Speakers of Other Languages (TESOL) in developing English learner'' collocation knowledge may also be applicable to training Chinese-speaking trainee interpreters (or other interpreters) who need to work into L2 English. For instance, as revealed in SLA studies, increased exposure would help language learners acquire more collocations (Szudarski & Carter, 2016; Zhang, 2017). Educators

may consider incorporating collocation exercises into the curriculum. Practical exercises can be designed to help trainees practise and internalise collocations. Activities such as gap-fill tasks, matching exercises, and translation tasks can be utilised to reinforce collocation learning and improve trainee'' familiarity with various collocation patterns.

Trainees can be encouraged to take responsibility for their collocation learning by maintaining a collocation journal or utilising digital resources, such as online corpora and dictionaries. This approach fosters independent learning and allows trainees to develop personalised strategies for mastering collocations relevant to their interpreting practice. Trainee interpreters could be taught to search for concordances of a given node in existing English corpora, such as COCA and BNC, and identify words collocating with the node they search for. Using a concordance, trainees may effectively develop their L2 English collocation knowledge (Chan & Liou, 2005; Lu, 2016). Trainee interpreters may also create their own English corpora and parallel translation/interpreting corpora based on topics or specific domains (e.g. medical, legal, business) they are interested in and explore the corpora with corpus query tools, such as Lancsbox.

In a methodological departure from prior investigations, the current research applies an innovative approach: the variationist multifactorial methodology (H. Kruger, 2019; H. Kruger & De Sutter, 2018; Volansky et al., 2015) to investigate the typical collocation features of interpreting products. Contrasting with earlier research on the collocation features of interpreted speech (Ferraresi & Miličević, 2017; Li & Halverson, 2020, 2022), the current research draws on methodologies adopted by L2 acquisition studies and provides an approach to systematically investigating the collocation features of interpreted speeches. By examining multiple parameters, including the raw frequency, diversity, complexity, and naturalness of collocations, this study can compile a collocation profile of interpreted speeches and discern interwoven factors shaping the end product of Chinese-to-English consecutive interpreting. Future research can adopt this method to investigate the collocation feature of translated texts and interpreted speeches. Through the implementation of the multifactorial methodology, the present study expands upon traditional monofactorial and univariate-oriented analyses (e.g. M. Baker, 2007; Bernardini & Ferraresi, 2011; Laviosa, 2002; Olohan, 2004), which are often criticised for their insufficiency in

elucidating linguistic patterns observed in translated and interpreted discourse (Rabinovich et al., 2015; Rodriguez-Castro, 2011; Santos, 1995).

Furthermore, as noted in Subsection 3.3.2, this study improved the TTR measure and STTR measure adopted by previous studies (Scott, 2004; Tsai, 2015) and put forward the measure of RSTTR to examine the collocation diversity of corpora. Based on a process of random sampling, this measure is effective in comparing the collocation diversity as well as the lexical diversity of corpora with different sizes and can be applied to other corpus-based linguistic studies.

In addition, this study combines the corpus method with human evaluation to assess the naturalness of interpreted speeches, which is considered an indicator of target language quality in interpreting quality assessment (Lee, 2008; Pöchhacker, 2001). Although target language quality, or "linguistic accessibility" as Pöchhacker (2001, p. 413) described it, has been incorporated as a criterion in interpreting quality assessment rating scales, such scale-based evaluations present certain limitations. Primarily, interpreting quality assessment is predominantly carried out by human raters, whose subjective judgments may differ among individuals (Drugan, 2013; Sawyer, 2004). Furthermore, once delivered, interpreted speeches are irretrievably lost (Gumul, 2008, p.193), making it challenging for raters to consistently assess interpreting quality. Consequently, raters may rely on intuitive scoring based on general impressions (Fulcher, 2015). This study demonstrates that by incorporating a corpus-based approach, trainee interpreters' products can be transformed into machine-readable data, enabling the evaluation of linguistic acceptability in English interpreting products through comparison with large-scale English corpora. Leveraging computer technology and reference corpora, a corpus-based interpreting quality assessment can mitigate the subjectivity inherent in human raters, potentially enhancing the consistency and reliability of the assessment process (Liu, 2021; Ouyang et al., 2021).

### 7.3 Limitations

This investigation is a pioneering effort to explore collocation features of interpreted speeches. It discovers typical collocation features of interpreted speeches and uncovers collocation-related linguistic shifts occurring during the interpreting process. The analysis of the frequency, diversity,

complexity of natural collocations and features of unnatural collocations provides insights into potential factors that influence the production of collocations in Chinese-to-English consecutive interpreting, thereby illuminating the nature of interpreting. Despite its innovative contributions, it is essential to acknowledge the limitations inherent in this study to properly evaluate and contextualise its findings.

The first limitation pertains to the research design. This study focuses on the production of trainee interpreters during situated training activities, with the primary objective of identifying collocation features of interpreting products as compared with the English conventionality and examining the relevance of collocation production to linguistic shifts made by interpreters throughout the interpreting process. To achieve these research aims, this study collected sufficient interpreted speeches produced by Chinese-speaking trainee interpreters and compiled a comparable corpus of L1 English speeches, as these were the best methods that could be employed to help answer the research questions. Nevertheless, other research methods, such as experiments and interviews, could be used to help shed light on more aspects pertaining to trainee interpreters' behaviours and provide more evidence about them. In addition, this study is corpus- and recording-based and did not collect interpreters' notes for analysis. The influence of notetaking on the collocation features of the interpreted speeches remains unknown. Without investigating the full interpreting process, disentangling factors contributing to typical collocation features observed becomes challenging, as noted by previous studies highlighting the issues with exploratory factor analysis (Biber, 1992; Xu, 2021). For instance, in this study, five types of collocations occurred less frequently in the interpreted speeches, whereas the trainee interpreters generated the other five types more frequently than L1 English speakers. While it is possible that trainee interpreters may exhibit imbalanced development in those ten types of collocation and may have been influenced by the Chinese language system and the limited working memory capacity, it is difficult to pinpoint the exact cause of the collocation overuse and underuse within the scope of this study. Future studies can employ complementary methodologies such as interviews and experiments to substantiate factors that lead to certain collocation features of interpreted speeches.

In addition, this study provides explanations more from cognitive and pedagogical perspectives and does not consider social and cultural factors due to limited resources, including the timeframe of this study. However, these aspects can help elucidate how cultural difference may have influenced the use of collocations in interpreted speeches. Lacking knowledge of culture-related collocations, interpreters may not be able to produce them as sufficiently as L1 English speakers. Interpreters may also be influenced by the possible expectations from speakers and target audiences and the preparation made before the mock conferences. Furthermore, since interpreters work in groups to interpret speeches, it is likely that their use of collocations is influenced by peers (Wilcox and Shaffer, 2005). As Henriksen (2007) suggested, interpreters may borrow collocations from their partners who work in the same booth in simultaneous interpreting. It is likely that such an influence from peers exists in Chinese-to-English consecutive interpreting as well. However, it is not within the scope of this study to uncover the influence of those factors with corpora only. Other research methods need to be integrated.

A further limitation of this study concerns the representativeness of findings derived from the interpreting corpus and the L1 English corpus. The CIS corpus includes interpreted speeches generated in only one language directionality (Chinese to English), one interpreting mode (consecutive interpreting), and a simulated scenario of conference interpreting. Additionally, the range of topics covered in CIS is relatively limited. Therefore, findings reported in the current research cannot be generalised to consecutive interpreting carried out in other language pairs and other modes. Moreover, although the present study collected data from 79 trainee interpreters, surpassing the sample size of most existing studies on trainees' interpreting performance, the size of the interpreting corpus remains small compared with other million-token or billion-token corpora such as BNC and COCA. As Laviosa (2004) contended, a corpus intended to represent the population of translated texts will consist of an array of sub-corpora, each exhibiting differing degrees of relevance, but all deemed legitimate objects of investigation. However, the current study was unable to construct a fully balanced and representative corpus within the project's timeframe, as compiling an interpreting corpus presents a formidable challenge in terms of data accessibility, the transcription process, and the inclusion of paralinguistic features such as fillers, pauses, and hesitations (Bernardini et al., 2018; Shlesinger, 1998). Though the size of CIS is not extensive, the included speeches are homogeneous in that they are delivered in similar settings by trainee interpreters with comparable L1 and L2 backgrounds, belonging to the same cohort and

having undergone similar interpreting training. Since the mock conference occurs annually at the UK university from which the present study collected data, the interpreting corpus can be further expanded to increase representativeness and facilitate other investigations of trainees' products. As for the corpus of L1 English speeches, this study discovered that some speeches were technical when analysing the data, and thus, the corpus included many specialised and technical collocations. This may have increased the collocation complexity of L1 English speeches, as technical terms usually present with high MI scores. In comparison, Chinese source speeches at mock conferences seem to be less technical than L1 English speeches. In this regard, the two corpora are not as comparable as this study assumed when designing the corpora and such an imbalance may have also contributed to the observed difference in the collocation complexity of the two corpora.

Further, the interpreting corpus does not support the examination of individual differences in collocation usage. Previous research has found that L1 and L2 English speakers' collocation knowledge varies among individuals, with factors such as exposure to English collocations, years of English study, educational experiences, age, vocabulary size, and nonverbal IQ playing a role (Dąbrowska, 2014a, 2014b, 2019; Fernández & Schmitt, 2015). For the present study, the trainee interpreters' background information (e.g. age, gender, English learning experiences, vocabulary size, IQ) was unavailable at the time of data collection. Therefore, the current study could not analyse the influence of individual differences on collocation usage in interpreted speeches, which is worth further exploration.

### 7.4 Future directions

The present study indicates that consecutive interpreting is a context in which interpreters mediate messages between two languages and face challenges as a result of the limited capacity of working memory. It would be interesting to incorporate speeches produced in other contexts that may involve the language control mechanism, such as L2 English production, the production of English as a foreign language, and L2 English translated texts for a comparison with L2 interpreted English. This would help identify the specific effect of language control, mental lexicon, and working memory on Chinese-to-English consecutive interpreting or other

interpreting into one's L2. Such endeavours would contribute to the understanding of interpreting as an activity constrained by multiple factors, potentially facilitating new empirical investigations.

Beyond the present study, the research scope could be further expanded to examine collocation features of interpreted speeches produced in other modes and language pairs, which would provide insights into the influence of other possible factors, such as language directionality (A-to-B vs. B-to-A), expertise (trainees vs. professionals), language specificity (language pairs other than Chinese-English), and interpreting modes (simultaneous interpreting, dialogue interpreting). Another research direction is identifying individual factors, such as age, gender, and language learning experiences, that influence collocation production in interpreting.

Moreover, as previously mentioned, the current study primarily investigated features of interpreted speeches with a corpus method, leaving some findings under-explained. Future studies could implement more sophisticalted statistical treatment, such as the multiple regression test, in analysing interpreting shifts and their correlations with typical collocation features of interpreting output. This test will help reveal statistical significance between interpreting shifts and features of each type of collocation. Future studies could also consider disentangling contributing factors by combining the corpus method with other research methodologies, such as interviewing interpreters about their perceptions of collocations and why they use certain collocations in interpreted speeches. Experiments can also be conducted on whether the occurrence of collocations in source speeches and the use of collocations in interpreted speeches unburdens the working memory of interpreters. The influence of interpreters' mental lexicon and the interference of source language expressions with target speech production is also worth investigating with experimental methods. This combination of different methodological approaches (e.g. combining corpus and experimental data) has already been adopted in other fields of applied linguistics (cf. Ellis & Simpson-Vlach, 2009; Gilquin & Gries, 2009). "Methodological pluralism" in interpreting research could help generate more "accurate, reliable, and generalisable findings", upon which interpreting scholars can construct robust theories (De Sutter & Lefer, 2020, p.6).

# Appendices

## Appendix A The Transcription Guidelines of the Interpreting Corpus

| Feature | Transcription guideline | Example |
|---|---|---|
| ID info | Each interpreter and speaker are | Speaker 001 |

| | | |
|---|---|---|
| | given a unique numeric code, which is consistent across every recording. The ID info of the interpreters should not be included in the transcript. | Interpreter 001 |
| Capitalization | Use word-initial-capital for proper nouns and "I". Proper nouns include:<br><br>(1) Names of people<br><br>(2) Capitalize all words of place names and derivatives.<br><br>(3) Religions, religious institutions and derivatives<br><br>(4) Names of days, months and festivals.<br><br>(5) Book and film titles (all words are capitalized including preposition)<br><br>(6) Phenomenon/ Diseases named after inventors | <br><br>(1) Shakespeare, Roger<br><br>(2) England, North Sea, American English, Mars, Earth (planet), Statue of Liberty.<br><br>(3) Christianity, Buddhism, Catholicism, Catholic, Buddhist<br><br>(4) Monday, February, Christmas, Chinese New Year<br><br>(5) Harry Potter And The Philosopher's Stone, Twelve Years A Slave (numbers spelled out), I Frankenstein (no comma), The Wolf Of Wall Street (capital The) |

| | | |
|---|---|---|
| | <u>Abbreviations/ acronyms and individual letters are capitalized.</u><br><br><u>Do not capitalize</u><br><br>(1) Titles or honorific uses<br><br>(2) Proper nouns that are used as common nouns or verbs | (6) Parkinson's disease; Alzheimer's disease<br><br>BBC, Mr., Ms., Mrs. Miss. PhD, PPT, AIDS, PDF<br>H O R S E (use spaces when spelling out a word letter by letter)<br><br>bishop, pope, king, duke, god, doctor, reverend, her majesty, her highness<br><br>I googled this<br>He was facebooking<br>She tweeted that she had no time |
| Punctuation | To ensure a consistent use of punctuation, avoid using commas, semi-colons, and exclamation marks. Only full stops and question marks are allowed to be used. | Can you help me?<br>Are you ready to go?<br>How did you do this?<br>This book is great isn't it? |
| Filled pauses | Only a small number of fillers are allowed to use, as is shown in the examples. No other fillers | oh (r**oa**d)<br>eh (b**e**d)<br>er (b**ir**d) |

| | | |
|---|---|---|
| | should be used. | erm (f**irm**)<br>huh (to show surprise)<br>mm (to show agreement) |
| False starts, self-repairs and unfinished sentences | Mark the false starts, self-repairs and unfinished sentences with = (with space) | Au= au= august<br>Any= anything<br>Cro= control<br>I don't under= I don't totally understand<br>Resem=<br>I was like=. He knows what I mean |
| Foreign word | No need to mark the foreign words | |
| Grammar error | Do not correct grammar errors | |
| Anonymization | Anonymize name of person with [name ] but do not anonymize place names and the name of celebrities. | [name]<br>Shakespeare<br>Thames |
| Pronunciation, spelling and contracted forms | Use normal American spelling if word is clear. Non-standard forms that appear in the dictionary are transcribed orthographically. | cos, dunno, gonna, gotta, kinda, lotta, sorta, wanna and yeah. |
| Numbers | All numbers should be spelt out. Do not use any punctuation marks between the words. | Zero<br>Three<br>Nineteen ninety two<br>Twenty thirteen |
| Okay | Always spell out okay | okay |
| Unclear features | PRONUNCIATION: Do not attempt to transcribe different accents or non-standard pronunciation. Use standard | |

| | | |
|---|---|---|
| | (dictionary) forms of words.<br>WRONG WORD: If an incorrect word is produced, record it as produced.<br><br>NON-WORD: Transcribe as produced | <br><br>this people; mine husband<br><br><br><br>discoverments |

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## Appendix C Part of Speech Tags of #LancsBox 5.1.2

| | | |
|---|---|---|
| 1 | CC | Coordinating conjunction |
| 2 | CD | Cardinal number |
| 3 | DT | Determiner |
| 4 | EX | Existential there |
| 5 | FW | Foreign word |
| 6 | IN | Preposition or subordinating conjunction |
| 7 | JJ | Adjective |
| 8 | JJR | Adjective, comparative |
| 9 | JJS | Adjective, superlative |
| 10 | LS | List item marker |
| 11 | MD | Modal |
| 12 | NN | Noun, singular or mass |
| 13 | NNS | Noun, plural |
| 14 | NP | Proper noun, singular |
| 15 | NPS | Proper noun, plural |
| 16 | PDT | Predeterminer |
| 17 | POS | Possessive ending |
| 18 | PP | Personal pronoun |
| 19 | PP$ | Possessive pronoun |
| 20 | RB | Adverb |
| 21 | RBR | Adverb, comparative |
| 22 | RBS | Adverb, superlative |
| 23 | RP | Particle |
| 24 | SYM | Symbol |
| 25 | TO | to |
| 26 | UH | Interjection |
| 27 | VB | Verb 'to be', base form |

28 VBD Verb 'to be', past tense

29 VBG Verb 'to be', gerund or present participle

30 VBN Verb 'to be', past participle

31 VBP Verb 'to be', non-3rd person singular present

32 VBZ Verb 'to be', 3rd person singular present

33 VH Verb 'to have', base form

34 VHD Verb 'to have', past tense

35 VHG Verb 'to have', gerund or present participle

36 VHN Verb 'to have', past participle

37 VHP Verb 'to have', non-3rd person singular present

38 VHZ Verb 'to have', 3rd person singular present

39 VV Verb, base form

40 VVD Verb, past tense

41 VVG Verb, gerund or present participle

42 VVN Verb, past participle

43 VVP Verb, non-3rd person singular present

44 VVZ Verb, 3rd person singular present

45 WDT Wh-determiner

46 WP Wh-pronoun

47 WP$ Possessive wh-pronoun

48 WRB Wh-adverb

## Appendix D Samples of the Tagged Corpora——CIS and CNS

**CIS**

60 So_IN all_DT erm_NN my_PP$ stories_NNS was_VBD just_RB pave_VV a_DT floor_NN for_IN my_PP$ topic_NN **today._NN**

61 So_IN my_PP$ topic_NN is_VBZ **about_RB** localization._NN

62 Actually_RB I_PP think_VVP localization_NN is_VBZ different_JJ from_IN what_WP we_PP called_VVD erm_JJ sinicization._NN

63 Because_IN sinicization_NN is_VBZ kind_NN of_IN translation_NN of_IN erm_NN of_IN text._NN

64 And=_CC **but_RB** I_PP think_VVP what_WP lies_VVZ under_IN the_DT texts_NNS is_VBZ about_RB erm_NN different=_JJ is_VBZ **about_RB** different_JJ languages_NNS cultures_NNS and_CC customers_NNS of_IN those_DT different_JJ things._NNS

65 So_IN er_NNS also_RB there_EX are_VBP **like_IN** erm_JJ different_JJ users._NNS

66 And_CC different_JJ layers_NNS will_MD have_VH different_JJ experiences._NNS

67 So_IN I_PP think_VVP localization_NN is_VBZ kind_NN of_IN very_RB broad_JJ an_DT idea_NN rather_RB than_IN a_DT narrow_JJ **one._CD**

68 And_CC I_PP don't_VVP|RB really_RB **like_IN** the_DT feeling_NN that_IN/that when_WRB you_PP go_VVP back_RB to_TO erm_VV China_NP and_CC have_VH some_DT gathering_NN party_NN with_IN a_DT friend._NN

69 And_CC maybe_RB your_PP$ friends_NNS will_MD ask_VV you_PP what_WP job_NN do_VVP you_PP do._VVP

70 And_CC when_WRB you_PP said_VVD I_PP do_VVP localization._NN

71 Their_PP$ reaction_NN is_VBZ **like_VV** oh_UH localization_NN is_VBZ sinicization_NN and_CC the_DT translation_NN of_IN subtitles._NNS

**CNS**

60 And_CC **can_NN** drives--_VVZ they_PP warm_VV the_DT hearts_NNS of_IN schools_NNS and_CC office_NN buildings_NNS that_WDT participate_VVP and_CC fill_VVP the_DT shelves_NNS of_IN food_NN banks_NNS and_CC food_NN pantries_NNS across_IN the_DT nation._NN

61 **This_DT** is_VBZ how_WRB we_PP work_VVP to_TO end_VV hunger._NN

62 And_CC what_WP I_PP come_VVN to_TO realize_VV is_VBZ that_IN/that we_PP

are_VBP doing_VVG **hunger_JJR** wrong._JJ

63 We_PP are_VBP doing_VVG the_DT same_JJ things_NNS **over_IN** and_CC **over_IN** and_CC **over_IN** again_RB and_CC expecting_VVG a_DT different_JJ end_NN result._NN

64 We_PP created_VVN a_DT cycle_NN that_WDT keeps_VVZ people_NNS dependent_JJ on_IN food_NN banks_NNS and_CC pantries_NNS on_IN a_DT monthly_JJ basis_NN for_IN food_NN that_WDT is_VBZ often_RB not_RB well-balanced_JJ and_CC certainly_RB doesn't_VVZ|RB provide_VV them_PP with_IN a_DT healthy_JJ meal._NN

65 In_IN the_DT US_NP our_PP$ approach_NN to_TO doing_VVG **good,_JJ** or_CC what_WP we_PP call_VVP "charity,"_NN has_VHZ actually_RB hindered_VVN us_PP from_IN making_VVG real_JJ progress._NN

The bold words are wrongly tagged.

Eight words are wrongly tagged in the sample of CIS, the total running characters of which is 152. The value of tagging accuracy rate in CIS is 94.74%.

In the sample of CNS, the total running words of which is 160, seven words are wrongly tagged, leading to an accuracy rate of 95.63%.

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