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Original Paper

A Corpus-Based Analysis of Pauses in Chinese-English Consecutive Interpreting of Chinese English Majors

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Abstract

This study aims to investigate pause characteristics and probe into the main reason for unnatural pauses in Chinese-English consecutive interpreting. The data were from the Parallel Corpus of Chinese EFL Learners-Spoken (PACCEL-S), which includes phonetic materials in the interpretation part of TEM-8. Forty interpreters were divided into four groups according to their scores and gender. Their recordings and transcribed texts were annotated and analyzed to provide a comprehensive overview of pausing. The findings are: (1) Pauses often occur in C-E CI. Interpreters use more UPs and unnatural pauses. (2) There is no interaction between proficiency and gender in pause duration and frequency, as well as the two indicators of unnatural pauses. (3) UP duration is affected by proficiency, and females tend to produce more FPs and unnatural pauses. (4) FP and UP invariably occur together but do not show linear correlation. (5) Interpreters tend to pause before content words, and unnatural pauses are mainly induced by notional word retrieval difficulty. By discussing pauses and explaining the leading motivation for unnatural pauses from the perspective of lexical retrieval, this study informs readers of the nature and features of pauses and provides suggestions for stakeholders.

Keywords

Chinese-English consecutive interpreting, pauses, PACCEL-S, characteristics, lexical retrieval

1. Introduction

As a translational activity, interpreting empowers those who are willing to communicate with others to break down language and cultural barriers, as well as offering ‘here and now’ benefits (Pöchhacker 2014:10). Regardless of the political, economic, cultural, or educational contexts, qualified interpreters are invited when the parties involved encounter the language barrier to guarantee smooth and sound communication. Among various qualities that excellent interpreters should possess, fluency has been acknowledged to assess interpreting performance or quality (Bühler, 1986; Kurz 1993). A widely

accepted belief is that the more fluently an interpreter outputs the target language, the higher rating he or she will achieve (Seleskovitch, 1978; Riccardi 2002; Lee, 2014). Since competent interpreters are usually expected to be fluent during the interpretation, disfluencies, for example, pauses, should be reduced or avoided to convey a high-quality production (Tissi, 2000).

However, according to Gile (1995), consecutive interpreting requires interpreters to listen to the source text, process it with notes, sensibly distribute their attention in a limited time, and ultimately produce the target text in another language. Due to the complexity of this task (e.g., time shortage, constraints of cognitive abilities, etc.), it is almost impossible to avoid disfluency in interpreting (Yang, 2004; Bao, 2005; Miao, 2009). Since pause, one of the most common disfluency symbols, is frequently seen in the bilingual transformation (Goffman, 1981), it can be a "window" for understanding disfluency and interpreting process, by analyzing which suggestions can be put forward for the stakeholders.

2. Literature Review

In this section, the author will briefly review the inspiring literature about pause characteristics in interpreting and those employed the corpus-based approach to probe into pausing. By stating the research gap, this section concludes with discussions on overcoming the previous studies' limitations.

2.1 Classifying Pauses into Different Categories

Scholars have classified pauses into several types to understand their nature and properties better. Maclay and Osgood (1959) were pioneers in putting forward the categories of pauses and three types of interruptions according to their function: silent pauses, filled pauses, repeats and false starts. Having made some modifications based on his predecessors, Hieke (1981) only maintained stalls-and-repairs taxonomy, the former of which included silent pauses, filled pauses, prospective repeats, and syllable lengthening, while the latter was comprised of false starts, retrospective repeats, and restoration of links. From the perspective of the pause function, Cenoz (1998) once classified pauses into two types, natural and unnatural, by whether they occur between phrases, clauses, and sentences. If so, they are counted as natural, or fall into the second category. Both Tissi (2000) and Cecot (2001) divided non-fluency into two types, silent pauses and disfluencies. Tissi (2000) decomposed disfluencies into filled pauses and interruptions, and Cecot (2001) provided a more detailed classification, describing disfluencies as filled pauses, repeats, restructuring, false starts, lengthening of vowels and consonants, and separating unfilled pauses into segmentation, rhetorical and hesitation pauses. However, Zellner (1994) and Pöchhacker (2004) mentioned only two kinds, filled and unfilled pauses, and recognized them as "the most general index" of disfluency.

Because of the heterogeneity of classifications, scholars usually choose the optimal taxonomy for their studies. The current research is to utilize the dichotomy of filled and unfilled pauses when talking about pause characteristics, which was also used in several studies on this subject in the field of psycholinguistics (Goldman-Eisler, 1961; Fu, 2013; Wang & Li, 2015; Fu & Wang, 2016; Wang et al., 2019; Han & An, 2020). A filled pause is often marked by fillers without meaning, such as um, ah, eh,

you know, and so on, while the unfilled pause is also called silent pause (Trouvain et al., 2016). In this research, I calculated and measured these two types of pauses. It should be noted that if filled and unfilled pauses coexisted in the same segment, it would classify it as a filled pause.

When exploring the motivation of pauses, what leads to those negative pauses needs discussing, and the natural interruption of speech flow due to physiological needs (breathing) or other appropriate reasons (Wang et al., 2019) should be excluded. Thus, this study differentiated natural and unnatural pauses according to the following criteria:

(1) All FPs or UPs occurring with FPs fall in the unnatural category.

(2) UPs caused by the difficulty of notional word retrieval are unnatural.

(3) Those pauses within syntactic units are unnatural, while between syntactic units are natural (Cenoz, 1998).

(4) Even if some pauses appeared between syntactic units, if they lasted distinctly so long, they would be regarded as unnatural.

Regarding those pauses induced by notional lexical retrieval, two types were incorporated. (1) If the first word after pauses is notional, the pauses will be classified as the target group. (2) Even if the following lexical item is a function word, we will judge the pause type based on the context. To explicate the criteria, Example 1 shows how the author identified natural pauses, unnatural pauses, and pauses caused by lexical retrieval.

Example 1.

Source speech: 首先请允许我代表宏业高科技有限公司董事会和全体员工，向今天前来出席开业典礼的领导、嘉宾和新闻界的朋友们表示最热烈的欢迎！

Target speech: <CE1>First of all <UP_0.353>, please_INT let me behalf of the Hong Ye's <UP_0.556> <FP_0.302> community_N <UP_0.526> to give_V <FP_0.578> <UP_0.770> warm_ADJ welcome <UP_0.347> to_PREP the <UP_1.210> to_PREP our, to our distinguished <UP_0.468> <FP_0.312> guests_N <UP_0.379> and_C our and the friends <UP _0.327> of_PREP <UP _0.305> press_N and newspapers, magazines. Ok.

According to Example 1, we can see (1) all the FPs (<FP_0.302>, <FP_0.578>, <FP_0.312>) and those UPs appearing simultaneously with FPs (<UP_0.556>, <UP_0.770>, <UP_0.468>) are unnatural; (2) UPs caused by notional lexical retrieval, such as <UP_0.353> and <UP_1.210>, are unnatural; (3) UPs appearing between syntactic units are counted. For instance, <UP _0.305> is within the prepositional phrase, which is unnatural. (4) Since <UP_1.210> is distinctively long, it can be classified as an unnatural pause directly in the light of the fourth principle.

2.2 Investigating Pause Features in Interpreting

The discussion of pauses mainly focuses on three aspects: (1) Talking about pauses in SI and CI; (2) Describing influencing factors of pause features. (3) Probing into motivations for pauses. This section will cover the three aspects as mentioned above, reviewing pausing in SI and CI, its relationship with interpreters' proficiency and gender, and the causes of pauses.

2.2.1 Pauses in Two Modes of Interpreting

To begin with, previous studies have discussed pausing in SI and CI. On the one hand, Tissi (2000) and Wang and Li (2015) compared two texts in simultaneous interpreting, examining the relationship between pause characteristics in ST and TT. Cecot (2001) documented the performance of professional interpreters in English-Italian simultaneous interpreting through pause frequency, duration, and function. By analyzing the silent pause produced in simultaneous interpreting, Piccaluga et al. (2005) regarded it as a window to understanding cognitive processing. On the other hand, Xu (2010) analyzed the causes of pauses in C-E CI, identifying twelve types of pauses according to their motivations. Dai (2011) examined undergraduates' pause features when consecutively interpreting Chinese into English. Han and An (2021) attempted to provide empirical evidence on the threshold of unfilled pauses in E-C CI.

2.2.2 Relationship between Pause Features and Other Variables

In addition, what can affect pause features is also a common topic. In the field of interpreting disfluency, a variety of factors may play a role in determining whether the speaker is fluent or not and the degree of his or her fluency, including interpreters' gender, identity, language proficiency, working memory, note features, the directionality of interpretation, etc. (Qi, 2021, p. 71). Here we will only cover the possible determinants sparking this study, that is, gender and proficiency. Considering that fluency of speech production is an essential indicator of oral proficiency (Housen & Kuiken, 2009; Iwashita, 2010; Lys, 2013), researchers have begun to investigate whether interpreters with different proficiency present diversified pause characteristics. Yang and Deng (2011) figured out that professional interpreters tended to pause less frequently in general. It is much easier to detect trainees' repairs and error corrections, while those experienced ones were better at covertly perfecting their production. Fu and Wang (2016) selected three groups of interpreters as research objects, finding a significant inter-group difference between high-score and low-score groups in terms of the total pause duration. Miao (2019) believed that with the improvement of interpreting proficiency, pause frequency and duration would decrease, while no apparent change was shown in the distribution of pauses.

Apart from interpreting proficiency, studies have also uncovered gender differences in pause habits when performing interpreting tasks. For example, Wang et al. (2019) stated that female interpreters were prone to use filled pauses more frequently, which further corroborated the findings of some studies (e.g., Cecot, 2001; Fu, 2012; Fu & Wang, 2016). Besides, Fu and Wang (2016) also concluded that men favored silent pauses in unit time, while Wang et al. (2019) did not find any significant difference in silent pause occurrence. Regarding pauses as a sign of self-correction, phonemic correction or direct deletion were more likely to be men's choices, while the number of lexical and grammatical corrections was more prominent in women's interpreting production (Dai, 2011). Magnifico and Defrancq (2019) found a gendered tendency towards using self-repairs in French-English interpreting, that is, women opted for more editing terms, but in Dutch production, there was no significant difference.

2.2.3 Motivations for Pauses

With respect to the impetus of pauses in interpreting, a widely accepted view lies in that pause, a sign of disfluency in interpreting production, is motivated by difficulties in various processes. Most people believe pause is attributed to interpreters' inability, the complexity of the tasks, and other external factors, such as the limitation of the interpreter's knowledge representation level and the degree of automation of his communicative behaviors (Kormos, 2006), the difficulty in understanding the source text, and finding proper equivalent expressions in the target speech (Piccaluga et al., 2005), the insufficient interpretation experience (Lin et al., 2018), the additional cognitive load of interpreting one language into another (Ahrens, 2005; Fitzmaurice & Purdy, 2015), as well as the noise, and accent or poor English of the speaker. Xu (2010) considered pauses in interpreting to be the embodiment of interpreters' self-monitoring ability to coordinate source language information, modify and optimize output, and improve interpretation performance. Similarly, Wang and Li (2015) also categorized pauses motivated by difficulties into three types, ranging from conceptualizing hardship in listening and analysis to formulating to output a better target text, and monitoring the process of interpreting.

From the perspective of cognitive processing and strategy application, another view is that pauses are caused by strategy usage, solutions to errors in speech planning instead of errors caused by the inability (Betz et al., 2015). For example, Xu (2010) explained the causes of pauses in CI as conceptualization, formulation, adoption of interpreting strategies, and other types. As Wang and Li (2015) claimed, the motivations for unnatural pauses in C-E SI also included the choice of interpreting-specific strategies, such as waiting for important cues, dealing with grammatical and syntactic differences by reconstructing, generalization and simplification, and splitting attention.

2.3 Exploring Pauses in Interpreting with Corpora

Scholars at home and abroad have delved into features and motivations of pauses in the two interpreting modes, and the factors leading to the differences in pauses, namely, interpreting level and gender. Even so, previous studies still have limitations. Firstly, most of the studies adopt the experimental method. There is no natural interpretation environment and a lack of ecological validity. Therefore, the performance of the subjects may be different from that in the natural scene, which ultimately affects the outcome (Qi, 2019). Secondly, the number of subjects is small. For example, Tissi (2000) and Wang and Li (2015) used ten subjects, and Xu (2010) only had five subjects. As Plevoets and Defrancq (2016) mentioned, the corpus-based approach can overcome some challenges inevitable in a highly controlled experimental environment (p. 207). In view of this, corpus-based research may be a better choice to obtain more robust results. Among a few studies that adopted the corpus-based approach, some decided to build small corpora based on research aim, while others chose existing corpora, for example, PACCEL.

2.3.1 Previous Studies on Pauses Based on Self-built Corpus

Some researchers single out self-built corpora, considering them more targeted and flexible to address the research questions. Wang and Li (2015) invited five professional and five trainee participants to

interpret a 12-minute Chinese speech at the Roundtable Meeting of the Sixth China-Shenzhen Consumer Goods Procurement Fair into English. Their texts were collected to establish a bilingual corpus to examine pause features in Chinese-English simultaneous interpreting. Wielding the power of a case corpus consisting of a VOA professional interpreter's simultaneous interpretation of President Trump's inaugural speech, Qi (2019) compared the pause frequency in ST and TT. In Song et al. 's (2021) study, 28 subjects were asked to simultaneously interpret the live videos of two English speeches, whose output was included in a bilingual corpus to probe into the effect of input speech on the fluency of English-Chinese simultaneous interpreting.

2.3.2 Previous Studies on Pauses Based on the Existing Corpus

Some researchers are inclined to use the existing corpus, since a large amount of available data are of great convenience and save the time of establishing corpus by themselves, among whom Bart Defrancq and his colleagues were interested in and actively took part in this field, focusing on the corpus-based studies on pauses in Dutch-English simultaneous interpreting. For instance, Defrancq and Plevoets (2018) selected interpreted data from European Parliament Interpreting Corpus Ghent (EPICG) and non-interpreted data from Corpus Gesproken Nederlands (CGN) to examine filled pauses from a perspective of cognition. They also calculated the frequency of filled pauses in the same two corpora to consider how to measure interpreters' cognitive load (Plevoets & Defrancq, 2018). Camille and Defrancq (2019) used EPICG to analyze the relationship between disfluencies in simultaneous interpreting and several factors.

When it comes to the Chinese-English language pair, three existing studies (i.e., Dai, 2011; Fu & Wang, 2016; Wang et al., 2019) have used Parallel Corpus of Chinese EFL Learners-Spoken (PACCEL-S) to probe into pauses in Chinese-English consecutive interpreting of Chinese English learners, which are also the most useful and inspiring literature for the present study. Dai (2011) was the first domestic scholar who used PACCEL-S to study the phenomenon of fluency in CI. He collected 100 interpreters and took proficiency and gender into consideration, discovering that pauses were associated with the interpreter's level, but not with their gender. Despite that, the standard of distinguishing low-score and high-score groups was not covered, nor was it how to categorize and annotate filled and unfilled pauses. Fu and Wang (2016) also pointed out that Dai's (2011) research did not conduct prior statistical tests to illustrate whether there was a significant difference between groups. Thus, it is reasonable to doubt the validity of his study (p. 99).

Having deliberated Dai's (2011) drawbacks, Fu and Wang (2016) chose 30 students and divided them into three groups according to their scores, revealing a significant difference in total pause duration between high-score and low-score groups, while there was none in the duration and frequency of pauses among the three groups. And the total pause duration and frequency were negatively correlated with scores, which verifies Dai's (2011) argument that pause is related to interpreting proficiency. Although some improvements have been made in Fu and Wang (2016)'s research, two limitations should be overcome: (1) Their study did not consider the potential interaction effect between gender

and proficiency; (2) it only focused on the description of pause features without further exploring what really caused this disfluency and trying to avoid it.

Three years later, Wang et al. (2019) refined their experimental design based on previous studies. Apart from talking about the relationship between pauses and proficiency and gender, the study also covered the characteristics of pause location and put forward an assumption that difficulty in extracting notional words is one of the main motivations for learners' pauses in Chinese-English interpretation. However, they also overlooked whether the two variables, the interpreter's gender and proficiency, may affect each other. In addition, when discussing pause distribution, they adopted the classification of filled and unfilled pauses. However, if the aim is to minimize the disfluency, the natural-and-unnatural pause dichotomy is more appropriate, and it is necessary to discuss how to decrease or even avoid negative pauses.

The three studies have not reached a consensus in terms of the relationship between specific pause features and the two variables, proficiency and gender. A few findings were even contrary to each other. And all of them had problems with the amount of data, methods of data analysis, etc. Given these points, this research will explore the interaction effect between gender and proficiency on pause duration, frequency, and distribution. Moreover, we will test whether notional word retrieval is the main reason for the unnatural pauses in C-E CI tasks of Chinese English majors. We hope this study can provide more solid results, explain the nature of pauses, and bring enlightenment to the stakeholders as well.

The three research questions are as follows:

RQ1: What are the characteristics of pauses in terms of their duration, frequency, and distribution in C-E CI for Chinese English majors?

RQ2: Is there any interaction effect between interpreters' gender and proficiency in terms of their pause features in C-E CI for Chinese English majors?

RQ3: What is the major motivation for unnatural pauses? Is it the difficulty of notional lexical retrieval?

3. Methodology

3.1 PACCEL-S

Parallel Corpus of Chinese EFL Learners is the first large-scale Chinese EFL learners' English Chinese and Chinese English written translation and interpretation corpus in China, including two sub-corpora, PACCEL-W and PACCEL-S (Wen & Wang, 2008). To survey the consecutive interpretation, PACCEL-S was selected in this study. According to Wen and Wang (2008), this corpus includes almost 0.5 million words, covering the previous TEM-8 oral examinations from 2003 to 2007. Through random selection in the sample, a total of 939 original voice files and their transcribed texts were collected and classified depending on the year and translation directionality. I chose this corpus because (1) It can provide naturalistic data induced in an authentic interpretation context. And all the test-takers

of TEM-8 were expected to be willing to perform well. (2) A great number of data, known as more than 900 radios, can be chosen from the database. (3) The data are from 18 universities all around the country, which can reflect the wide range of samples and their representativeness. (4) Compared to the self-built corpus, using the existing one is more convenient and efficient. (5) Among several Chinese-English interpretation corpora in China, including but not limited to Chinese-English Conference Interpreting Corpus (CECIC), Hong Kong Bilingual Interpreting Corpus on Contemporary Social Life, and the Corpus of Chinese-English Interpreting for Premier Press Conference, etc., PACCEL-S is the only available one for public (Shao, 2020, p. 377). (6) According to Li and Wang (2016), when exploring students' interpreting features, PACCEL-S is an appropriate corpus. Considering these points, I assume it is adequate to select data from PACCEL-S to explore pause features and discover secrets of interpreting production of Chinese English majors.

3.2 Participants

A total of 40 participants (M = 71.15, SD = 9.70) who took part in the TEM-8 oral test in 2007 were chosen. They were junior or senior students majoring in English from 18 universities in China. All participants had Chinese as their L1, and English as their L2. Determined by the curriculum characteristics of Chinese English majors, they are thought to have not learned much about interpreting and have little interpreting experience. According to their gender and rating, the selected participants can be categorized into four groups, high-score male group (M = 78.80, SD =8.73), high-score female group (M = 79.00, SD = 6.77), low-score male group (M = 63.50, SD = 3.69), and low-score female group (M = 63.30, SD =2.26). In total, 40 recordings and their transcribed texts were collected.

3.3 Materials

The material of the Chinese-English interpretation section is a short Chinese passage of approximately 400 words. It is a general and easy-to-understand topic, an opening ceremony speech of a company called Hongye, where there are no professional terms, incomprehensible slang, and dialects.

In the TEM-8 oral test (2007), this interpreting material was read by a native Chinese speaker at an ordinary speed twice. For the first time, the whole passage was read to familiarize participants with the content, after which five sentences (M = 40.40, SD = 10.81) were randomly picked out. Then participants listened to and interpreted them one by one. There was a short pause between every two sentences, whose beginning and the end were signaled by a sound. When one heard the sound, he or she should interpret the source text immediately. And when hearing the sound again, the individual should stop. During the listening process, students were permitted to make some notes if they wanted (Wen & Wang, 2008).

Remarkably, although before interpreting, participants had access to the source text, which is inconsistent with actual consecutive interpreting, it is presumed that due to the interpreting proficiency of participants and their ignorance of what they were going to interpret, this cannot make a difference to the results.

3.4 Data Processing

Although PACCEL-S has provided various information, such as the student's basic information, some grammatical mistakes, transcribed texts, etc., it does not include tags of pause type, duration, and POS tagging of the first word after pauses. Thus, further processing is inevitably required, which contains preprocessing, annotating, and POS tagging, after which data analysis will be carried out. During this procedure, Adobe Audition 2021 was used for audio editing, Praat (Boersma & Weenink, 2013) for data segmentation and annotation, AntConc (Anthony, 2022) for corpus analysis, and SPSS 26.0 for statistical testing.

Preprocessing. Two tasks were done in the first step. For the sake of convenience and time-saving in the following steps, the redundant parts of the recording should be omitted. Each recording file in the sample was loaded into Adobe Audition 2021 and edited with the previous parameter set maintained. Having finished editing, we only retained the Chinese-English interpretation tasks composed of five segments. Besides, since the audio file number corresponding to the transcribed text was not clearly shown, we had to check the consistency between the recording and the text. Six mistakes were figured out and corrected through careful inspection.

Annotating pause type and duration. The edited recordings were imported into Praat, and the corresponding Text Grid file was created with three tiers. Then we manually selected pauses and marked their time, including all FPs and UPs. In the text annotation layer, two types of pauses, separated by boundaries, were respectively represented by FP (filled pause) and UP (unfilled pause), with time duration followed in milliseconds (see Figure 1). Notably, considering most scholars (Goldman-Eisler, 1958; Cecot, 2001; Mead, 2002; Qi, 2019) adopted 250 ms as the minimum threshold of UPs, this study also chose it, which means any silent break longer than 250 ms would be counted as a UP. Also, the pause information was inserted into the original transcribed text, after which natural- and unnatural-pause tags and whether the pause was caused by notional word retrieval would be identified in the text files. Remarkably, by virtue of artificially marking pause types and the difficulty of determining which group pauses belong to, it is seemingly impossible to avoid subjectivity. Thus, when it was hard to decide, we adhered to a principle: if we hesitated to classify whether a pause was natural or not, we would put it into the unnatural group; if we were not sure whether it was caused by lexical retrieval, we would exclude it directly. The reason why we did this is that if, in this case, the pause induced by the lexical retrieval difficulty still accounts for a large proportion of the unnatural pauses, the hypothesis of the primary reason for unnatural pauses must be correct.

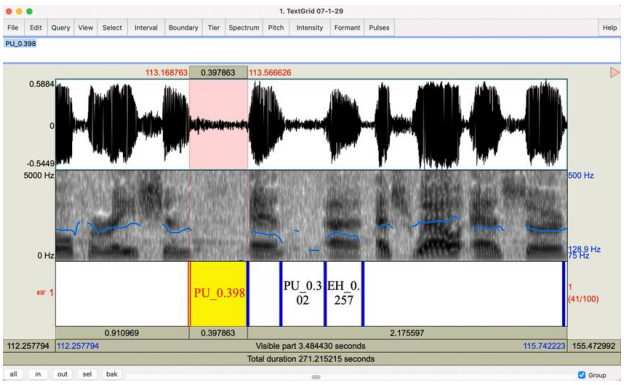

Figure 1. The Annotation of Two Pauses in Praat

POS tagging. This step lies in part-of-speech tagging of the first word after pauses. For the purpose of this study, WEannotated each word in the transcribed texts for nine parameters, namely noun (N), verb (V), adjective (ADJ), adverb (ADV), pronoun (P), number (NUM), conjunction (C), article (A), preposition (PREP), and interjection (I). The former five belong to notional words, while the left is function words.

Statistical analysis. The data was imported into Antconc to obtain information about the number, duration, and distribution of pauses, as well as word clusters of FPs and UPs. Ultimately, SPSS 26.0 was employed to analyze relevant data in both descriptive and inferential ways.

4. Results

To guarantee comparability of the data, we ought to test whether the grades of the high-score group and low-score group differ, while male and female interpreters of the same proficiency fall into the same population. To this end, we conducted a normal distribution test to determine which method should be employed. Having realized data in the low-score female group, the high-score female group, and the high-score male group were normally distributed, while the low-score male group ($W = 0.78$, $p < .01$) was not, we chose an independent sample *t* test to examine female and high-score group and adopted Mann-Whitney U test to analyze male and low-score group. The findings presented a significant difference between high-score and low-score male ($U = 0$, $p < .001$) and female ($t(12) = -6.638$, $p < .001$) interpreters, but different results were not shown between female and male interpreters' high-score ($t(18) = .057$, $p = .955$) and low-score ($U = 48$, $p = .878$) groups. Therefore, further statistical analysis can be carried out.

4.1 Features of Pause Duration

Table 1. Tests of Effects of Gender and Proficiency on Pause Duration

Dependent variable: pause duration

Source	Type III Sum	df	Mean Square	F	Sig.

	of Squares				
Gender	57.888	1	57.888	2.074	0.158
Proficiency	330.970	1	330.970	11858	0.001
Gender*proficiency	1.211	1	1.211	0.043	0.836
Error	1004.782	36	27.911		

a. R Squared = 0.253 (Adjusted R Squared = 0.191).

Univariate analysis of general linear models was performed to assess the potential interaction effect (see Table 1), which indicates that neither the interaction effect between gender and proficiency (F (1,36) = .043, p = .836), nor the main effect of gender (F (1,36) = 2.074, p = .158, was statistically significant. However, the main effect of proficiency (F (1,36) = 11.858, p < .05), was significant. To further determine how it influences pause duration, we conducted a paired sample *t* test to compare UP and FP duration in two groups of people for high and low proficiency conditions, and an independent samples *t* test to compare high-score and low-score groups under two pause conditions. It was found that no matter in high-score (t (19) = 9.59, p < .001) or low-score (t (19) = 11.45, p < .001) group, UP was longer than FP. Besides, a significant difference was uncovered in UP duration (t (38) = 3.59, p < .01) in groups of different levels, but a similar phenomenon did not appear in FP duration (t (38) = 3.44, p = 0.601) and total pause duration (t (38) = 1.65, p = .107). It is suggested that proficiency affects UP duration but does not influence FP and total pause duration.

Since Fu and Wang (2016) once argued the negative correlation between the duration of FPs and UPs without considering the possible influence of interpreters' expertise, their outcome should be retested. Thus, we implemented the Pearson correlation analysis between the duration of FPs and UPs, recognizing no significant linear correlation in both the high-score group (r (18) = -.149, p = .530) and low-score group (r (18) = .275, p = .241), which refutes the previous finding.

Table 2. Tests of Effects of Gender and Proficiency on Unnatural pause Duration

Dependent variable: unnatural pause duration

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Gender	196.205	1	196.205	5.683	0.023
Proficiency	298.608	1	298.608	8.649	0.006
Gender*proficiency	0.007	1	0.007	0.000	0.989
Error	1242.845	36	34.523		

a. R Squared = 0.285 (Adjusted R Squared = 0.225)

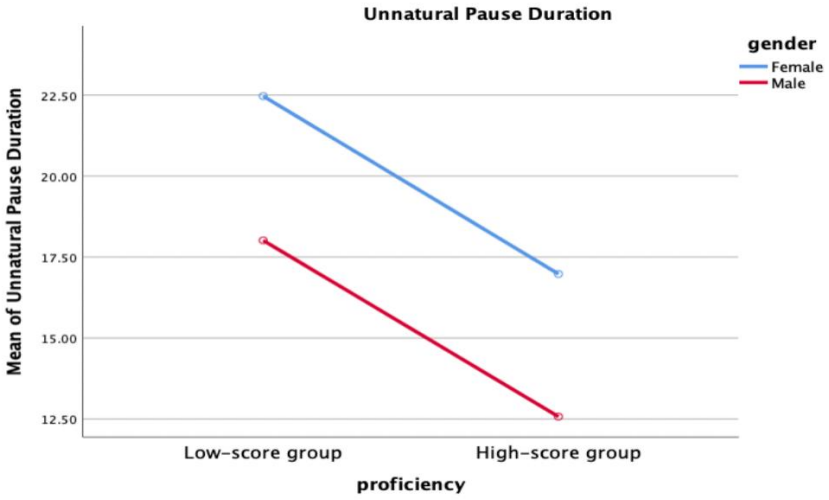

Figure 2. Interaction Plot for Unnatural Pause Duration

As shown in Table 2, there was no significant interaction, F (1, 36) = .00, p = .989, but the main effect for gender and proficiency were significant (gender: F (1, 36) = 5.68, p = .023 < .05; proficiency: F (1, 36) =8.65, p = .006 < .01). Based on Figure 2, we can identify that female interpreters have longer unnatural pause duration than males, and when the interpreter's proficiency is higher, the unnatural pause time tends to be shorter.

4.2 Features of Pause Frequency

Table 3. Tests of Effects of Gender and Proficiency on Pause Frequency

Dependent variable: pause frequency

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Gender	403.225	1	403.225	4.595	0.039
Proficiency	38.025	1	38.025	0.433	0.515
Gender*proficiency	0.625	1	0.625	0.007	0.933
Error	3158.900	36	87.747		

a. R Squared = 0.123 (Adjusted R Squared = 0.050).

According to Table 3, there was no statistically significant difference between the effects of gender and proficiency on pause frequency (F (1,36) = .007, p = .993) and in terms of the main effect of proficiency (F (1,36) = .433, p = .515), but that of gender was significant (F (1,36) = 4.595, p < .05). It means gender has an influence on pause frequency, but proficiency does not. To figure out the detailed

relationship between gender and pause frequency, we used similar statistical methods to those adopted in pause duration, which revealed that in both female ($t(19) = 10.173$, $p < .001$) and male groups ($t(19) = 15.356$, $p < .001$), UP frequency significantly outnumbered FP frequency. In addition, a significant difference was between the male ($M = 5.05$, $SD = 4.38$) and female ($M = 10.95$, $SD = 6.98$) group in terms of FP frequency ($t(38) = -3.20$, $p < .01$), revealing a gendered tendency in FP usage.

When exploring the relationship between the frequency of FPs and UPs, Fu and Wang (2016) also ignored its interference factor, gender. Hence, we replicated their correlation test with the change of discussing male and female interpreters separately, while finding no linear correlation in the female group ($r(18) = .332$, $p = .152$) and male group ($r(18) = -.162$, $p = .495$).

Table 4. Tests of Effects of Gender and Proficiency on Unnatural Pause Frequency

Dependent variable: unnatural pause frequency

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Gender	1010.025	1	1010.025	8.259	0.007
Proficiency	24.025	1	24.025	0.196	0.660
Gender*proficiency	0.225	1	0.225	0.002	0.966
Error	4402.500	36	122.292		

a. R Squared = 0.190 (Adjusted R Squared = 0.123).

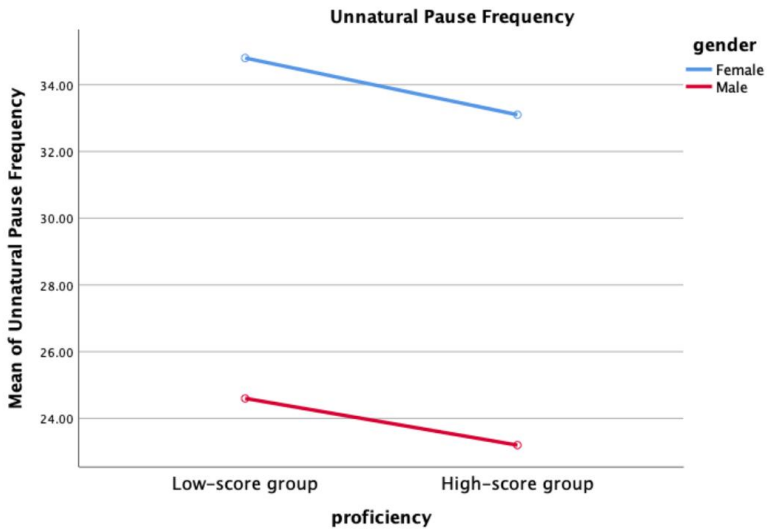

Figure 3. Interaction Plot for Unnatural Pause Frequency

According to Table 4, the interaction effect was insignificant in unnatural pause frequency, $F(1, 36) = .002$, $p = .966$, nor was the main effect in proficiency, $F(1, 36) = .196$, $p = .660$, while for gender,

there was a significant main effect, F (1, 36) = 8.259, p = .007 < .01. Figure 3 shows that women use unnatural pause more frequently.

4.3 Features of Pause Distribution

Statistics show that in the four groups (female GL, female GH, male GL, and male GH), the mean number of pauses before NWs per minute (M = 166, SD = 9.25) outnumbered those before FWs (M = 95, SD = 16.18). In the NW category, the figure of pauses before nouns and verbs ranked first and second, accounting for 23.49% and 18.59%. In the FW group, prepositions took first place (13.42%), followed by conjunctions (13.42%), articles (10.38%), and interjections (0.88%).

Table 5. The Word Clusters of FPs and UPs

Rank	Frequency	Clusters	Percentage(%)	Frequency	Clusters	Percentage(%)
1	240	FP UP	38.28	497	UP FP	23.38
2	41	FP the	6.54	211	UP and	9.92
3	17	FP to	2.71	162	UP the	7.62
4	16	FP is	2.55	83	UP to	3.90
5	13	FP leaders	2.07	73	UP of	3.43

Clusters analysis was conducted with AntConc 4.0.3 to uncover what words FPs and UPs usually appear with and the characteristics of the first word after a pause. The top 5 clusters of FP and UP are presented in Table 4. According to the list, word clusters “FP UP” and “UP FP” ranked first in their columns, respectively accounting for 38.28% and 23.38%, indicating that UPs and FPs frequently occur together. Apart from UPs, the first word after FPs is usually the function word, such as articles (the, 6.54%) and prepositions (to, 2.71%), which can partly provide evidence for the large share of pauses before prepositions. With regard to UPs, among the five most frequent word clusters, four of them were comprised of a UP and a function word, which in descending order of occurrence is: conjunction (and, 9.92%), article (the, 7.62%), and preposition (to, 3.90%; of, 3.43%).

4.4 Motivations for Unnatural Pauses

Considering that the first word after pauses were often notional words, and most pauses were unnatural, we assumed that the crucial incentive to pause in C-E CI was the difficulty of notional lexical retrieval.

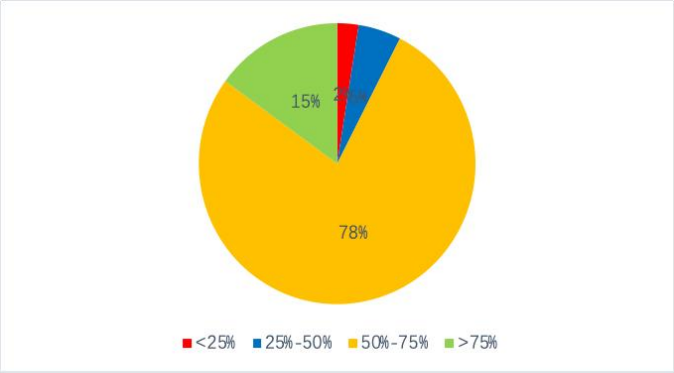

Figure 4. The Proportion of Pause Frequency Caused by Difficulty in Notional Word Retrieval

To identify whether the decisive reason for unnatural pauses lies in the difficulty of notional lexical retrieval, we measured the proportion of unnatural pauses caused by notional word retrieval (see Figure 4), finding that 93% of the interpreters' pauses caused by difficulties in retrieving notional words account for more than half of the unnatural pauses, which demonstrates that the difficulty in extracting notional words is indeed the primary cause of unnatural pauses.

5. Discussion

5.1 Discussion on Pause Features

The process of C-E CI is full of UPs and FPs, which reveals the difficulty of and tremendous pressure in this activity (Wang & Li, 2015) and proves that pausing is unavoidable in language production (Goto et al., 1999, p. 227). UPs are more frequent and longer than FPs, regardless of gender and proficiency, showing that Chinese English majors prefer to use UPs when they conduct C-E CI. Besides, UPs and FPs usually co-occur with each other.

Concerning pause duration and frequency, no interaction effect was found between gender and expertise level of interpreters in C-E CI. Gender only affects pause frequency, and pause duration only depends on proficiency. Therefore, we suggest that in future research, when discussing occurrences of pauses, the researcher needs to control the "gender" factor. When it comes to pause duration, the potential impact of the interpreter's proficiency should also be considered.

What's more, scholars generally believe that UPs are essential to measure fluency in interpreting (e.g., Tissi, 2000; Cecot, 2001; Pio, 2003), that is, the less frequent and shorter UPs are, the more fluently the interpreter speaks (Han & An, 2021). Given that fluency has always been a reliable measure of language competence (e.g., Schmidt, 1992; Rosselli et al., 2000; Andreou et al., 2005), we may initially assume that both UP duration and frequency are related to the interpreter's proficiency. However, this study partly denied this hypothesis, revealing that only UP duration is bound up with interpreters' proficiency. Specifically, the higher the interpreting competence, the shorter the UP duration, consistent with previous research (e.g., Wang & Li, 2015; Fu & Wang, 2016). Hence, the UP duration can be considered a crucial factor in evaluating an interpreter's performance in placement examinations.

Moreover, in daily training, educators should inspire students to reduce UP time consciously.

In terms of FPs, their duration seems to indicate personal traits and cannot be influenced by interpreters' gender or proficiency, while their occurrence embodies a gendered tendency, which was also mentioned in some studies (e.g., Cecot, 2001; Fu, 2012; Wang et al., 2019). Females are found to use FPs more frequently compared with male interpreters. In this research, the target object is English learners, whose interpretation level is relatively elementary. While for professional interpreters, a similar result is also found in some studies. For example, Jiang and Hu (2020) studied the interpreting features of professional interpreters of different genders from the Ministry of Foreign Affairs of China, revealing that the figure of filled pause in the output of female interpreters is about three times that of male interpreters. This finding also supports the result that filled pause frequency can be modulated by gender but is independent of interpreters' proficiency. Besides, they explicated FPs from an optimistic view, arguing that using FPs can not only avoid awkward silence and save the interpreter's face, but also improve the audience's participation in interpreting. In contrast, another perspective lies in the gender difference in language use. Lakoff (1973), as the pioneer in this field, has put forward several features of men's and women's language. The focus of women in language production is to harmonize and develop the interpersonal relationship through communication (Tannen, 1990), which means they are bound to be more careful about the accuracy of diction, while men are concerned more about conveying information (Yang, 1996; Fu & Wang, 2016; Wang et al., 2019). Thus, women's pursuit of perfection and monitoring of language accuracy play a part in the additional quantities of FPs. We suppose that the first explanation may not be generalized to interpreters of different levels, since their objects of discussion are professionals, who can pay more attention to their image and the response of the audience. Nevertheless, beginners may focus on the code-switching itself without extra attention and consciousness. In contrast, the second opinion may have the universal explanation strength in that it is aimed at language use differences between the two genders.

In addition, there is no significant correlation between the two pauses in the dimension of duration and frequency. As Fu and Wang (2016) discovered, the longer and more frequent UP in unit time used by interpreters, the less time and frequency of FPs. That is, the duration and occurrence of FPs were inversely proportional to those of UPs. However, similar results were not obtained in the present study. The outcomes are divergent because Fu and Wang (2016) did not consider the potential influence of gender on FPs and that of proficiency on UPs, only implementing correlation analysis between the two pauses among all participants without any grouping, emphasizing the importance of eliminating interference factors.

Regarding the unnatural pause, the interpretation level is inversely proportional to its duration. As Wang and Li (2015) stated, lower-level interpreters usually encounter difficulties in listening and comprehension, allocating their attention, and other basic operations in interpreting, which experts have extended beyond. This difference provides a possible explanation for the longer time of unnatural pauses in the low-score group. Interestingly, females were found to produce more unnatural pauses. We

suppose this result may be given rise to women's preference for filled pauses, which, after all, account for a substantial part of unnatural pauses.

Concerning pause distribution, overall word clusters showed that pauses were usually grouped with function words, like prepositions, articles, and conjunctions, but interpreters tended to pause more frequently before notional words compared to function ones. In effect, notional words possess semantic meanings and are able to transmit information. Function words only manifest grammatical functions. It is believed that function words are often employed to induce complex sentence structure (Richels et al., 2010), and due to their higher frequency than the counterpart, we assume that the real reason is the difficulty in content word retrieval instead of that in function words.

Based on the characteristics of pauses mentioned above, suggestions are as follows: (1) Having known UP duration and unnatural pause duration are related to interpreters' performance, teachers should raise students' awareness of lessening pauses, especially these two kinds to help them obtain better evaluation results from the audience and the clients, as well as score higher in CI tests. (2) In CI, the gender difference in terms of FPs should also be considered. Women should be told that some mistakes are acceptable in interpreting and encouraged to avoid perfectionism. On the contrary, male interpreters should care more about their choice of words. (3) For test policymakers, they would better consider UP duration as a criteria dimension when evaluating C-E CI performance or ranking candidates.

5.2 Discussion on the Main Cause of Unnatural Pauses

Having realized the difficulty in content word retrieval is the paramount reason for unnatural pauses, we further discuss how to explicate this result, i.e., why interpreters have such hardship in C-E CI? Since the most fundamental level of bilingual transformation is words, and interpretation involves receiving cues or stimuli in one language, switching their linguistic codes, and finally producing the target language, theories and models of lexical retrieval in language production can apply to explain the lexical selection in consecutive interpreting (Zhang & Liu, 2011, p. 40).

One of the most important supporters of language-specific selection theory is Green (1998)'s Inhibitory Control model. It is believed that in C-E CI, both semantic lexicons of the target language (English) and non-target language (Chinese) will be activated at the same time. Accordingly, non-target language words may interfere with retrieving target language words, and only the "winner" in the competition will be successfully selected. Given this, bilinguals need to activate the inhibition mechanism, that is, to achieve the goal of retrieving the target word by inhibiting the activation level of non-target language and making it lower than that of the target language. Apart from interlanguage competition, intralingual competition is also the cause of pauses in C-E CI. According to the Spreading Activation model, in addition to the target words, the related concept nodes will also be activated, thus forming a mental lexicon network connected by many concept nodes (Kroll & de Groot, 2005). Then the activated nodes compete with the target words, interfering with or even hindering the activation of their competitors.

In reality, competition between two languages and among similar words in the target language will set up obstacles to lexical retrieval in interpreting, which requires more time for interpreters to inhibit the

source language or choose the appropriate word among activated words in the target language. Therefore, pauses are common, and interpreters always encounter content word retrieval difficulties in C-E CI.

Given that the competence of notional word retrieval plays an integral part in consecutive interpreting performance, it is high time that we talk about how to improve the efficiency of accessing and retrieving notional words. According to Snellings et al. (2004), lexical retrieval consists of concept selection of lexical items and encoding them at morphological, phonological, and phonetical levels, after which words are produced. Its efficiency is determined by lexical retrieval speed and accuracy (Cai et al., 2015, p. 107).

When considering the cross-language competition, interpreters should first focus on their second language proficiency to speed up lexical retrieval. In Green's model, it is mentioned that with the improvement of the interpreter's second language proficiency, the degree of activation of L2 may be greater, and the cognitive effort to inhibit L1 will be less (Green, 1998). It implicates that interpreters with higher L2 proficiency may spend less time suppressing the representation of their L1 and activating their L2. Additionally, Li et al. (2011) identified different lexical retrieval mechanisms in groups of high- and low-proficiency. More specifically, those bilinguals with low L2 proficiency presented cross-language competition, while their counterparts did not. If so, the interference between languages will be reduced with increased L2 language competence, thereby cutting down the time required for the competition. Liu and Hu (2012) also found an apparent positive correlation between L2 proficiency and the speed and quality of lexical processing in Chinese-English translation tasks, providing empirical evidence for this assertion.

Concerning the competition within a language, word selection efficiency may depend on interpreters' vocabulary mastery. According to Bialystok et al. (2008), vocabulary size did greatly contribute to performance on lexical retrieval tasks. Thus, interpreters are advised to pay more attention to enlarging their vocabulary. What's more, since interpreters are usually uncertain which one is the most appropriate among two- or more-word choices, trainees ought to understand the subtle differences among synonyms and manage to remember more fixed collocations, so that they can accelerate their word selection.

In general, frequent usage of L2 and sufficient interpreting training with a focus on speed and accuracy are also appropriate ways of quickening lexical retrieval and guaranteeing its accuracy. Ecke (2015) has realized the importance of language use to word retrieval speed, stating that the two variables were correlated. De Bot and Lowie (2010) even held the view that, especially for L2, although someone did not use a language only for a few days, he or she might find his or her word retrieval speed slower. Thus, interpreters would better search for or create a L2 environment, trying to use the nondominant language as frequently as they can. Given this, interpreting practice may be a means of using L2, as well as refining interpretation skills. Dong and Zhong (2017) mentioned that the advantage of some procedures of inhibitory control, including conflict monitoring and interference suppression, could be

enhanced by interpretation training. Santilli et al. (2019) compared the lexical processing efficiency in professional simultaneous interpreters and non-interpreter bilinguals, discovering that the former group performed better than the latter in both languages. Evidently, professional interpreters have received adequate interpretation training and become experienced in interpretation practice, which fuels their efficiency of word retrieval. However, Tymczyńska's (2012) research found that lexical retrieval speed would not increase with practice. We infer that this outcome may be because the training was insufficient to manifest the expected effects and the lack of emphasis on interpreting training. After all, Snellings and Gelderen (2002) once figured out that training focusing on speed and immediate feedback on speed and correctness can effectively fasten the speed of lexical retrieval and improve its accuracy.

6. Conclusion

This study investigated the features of pauses in terms of duration, frequency, and distribution with a corpus-based approach, and probed into the main cause for unnatural pauses, suggesting that: (1) Pausing is a common phenomenon in Chinese-English consecutive interpreting, and interpreters are inclined to use more UPs and unnatural pauses; (2) UP and unnatural pause duration should be reduced in interpreting to acquire better assessment, and it can be included as an indicator in CI examinations; (3) Apparent gender feature has been revealed in FP frequency and unnatural pause occurrence; (4) FP and UP are not correlated with each other in both duration and frequency aspects, while always co-occur. (5) Interpreters tend to pause before content words, and unnatural pauses are mainly caused by the notional word retrieval difficulty. Accordingly, we advise that interpreters ought to cut down their UP duration and improve their lexical retrieval efficiency by enhancing L2 competence, expanding their vocabulary, distinguishing synonyms, and mastering fixed expression, as well as practising C-E CI as frequently as possible with an eye to lexical retrieval speed and accuracy. Besides, teachers should take into consideration gender differences in the usage of unfilled pauses, and train interpreters of different genders with different teaching methods and emphasis. Moreover, examiners can consider UP duration as one of the useful factors in determining interpreting performance and assessment.

The present research also has a few limitations. First, although the corpus approach ensured the authenticity of the situation and did not interfere with the participants' interpretation process, there was a lack of dynamic communication and interaction with research subjects, which resulted in difficulty when analyzing motivations for pauses. When judging whether the unnatural pause was caused by lexical retrieval difficulty, we had to make a personal decision with the static transcribed text. Therefore, subjectivity might inevitably influence the outcomes. What's more, Christoffels et al. (2003) asserted that lexical retrieval during interpreting consisted of two steps: searching for the word corresponding to a given concept and retrieving its translation equivalent in another language, while notional lexical retrieval was not further classified here. We hope future research can use a

mixed-method approach, such as corpus combined with the retrospective interview, EEG or fMRI, to analyze the sub-process of content word retrieval, so that more solid results and detailed explanations for reasons of pauses can be drawn.

References

Ahrens, B. (2005). Prosodic phenomena in simultaneous interpreting: A conceptual. approach and its practical application. *Interpreting*, *7*(1), 51-76. https://doi.org/10.1075/intp.7.1.04ahr

Andreou, G., Vlachos, F., & Andreou, E. (2005). Affecting factors in second language learning. *Journal of Psycholinguistic Research*, *34*(5), 429-438. https://doi.org/ 10.1007/s10936-005-6202-0

Anthony, L. (2022). *AntConc (Version 4.0.5)* [Computer Software]. Tokyo: Waseda University.

Bao, G. (2005). *Introducing Interpreting Studies*. Beijing: China Translation and Publishing Corporation.

Betz, S., Wagner, P., & Schlangen, D. (2015). Micro-structure of disfluencies: Basics for conversational speech synthesis. In *Sixteenth Annual Conference of the International Speech Communication Association*. New York: Curran Associates.

Bialystok, E., Fergus, C., & Luk, G. (2008). Lexical access in bilinguals: Effects of vocabulary size and executive control. *Journal of Neurolinguistics*, *21*(6), 522-538. https://doi.org/10.1016/j.jneuroling.2007.07.001

Boersma, P., & Weenink, D. (2013). Praat: doing phonetics by computer [Computer program]. *Version 5.3. 51*. http://www. praat. org/retrieved

Bühler, H. (1986). Linguistic (semantic) and extra-linguistic (pragmatic) criteria for the evaluation of conference interpretation and interpreters. *Multilingua*, *5*(4), 23-32. https://doi.org/10.1515/mult.1986.5.4.231

Cai, R., Dong, Y., Zhao, N., & Lin, J. (2015). Factors contributing to individual differences in the development of consecutive interpreting competence for beginner student interpreters. *The Interpreter and Translator Trainer*, *9*(1), 104-120. https://doi.org/10.1080/1750399X.2015.1016279

Camille, C., & Defrancq, B. (2019). *Disfluencies in simultaneous interpreting, a corpus-based study with special reference to sex.* In C. Camille & B. Defrancq (Eds.), *New empirical perspectives on translation and interpreting* (pp. 264-299), London/New York: Routledge. https://doi.org/10.4324/9780429030376-12

Cecot, M. (2001). Pauses in simultaneous interpretation: A consecutive analysis of professional interpreters' performances. *The Interpreters' Newsletter*, *11*, 63-85.

Cenoz, J. (1998). Pauses and communication strategies in second language speech. *Reports Research*, *143*, 25-36. https://doi.org/10.1075/itl.127-128.03cen

Christoffels, I. K., De Groot, A. M. B., & Waldorp, L. J. (2003). Basic skills in a complex task: A graphical model relating memory and lexical retrieval to simultaneous interpreting. *Bilingualism:*

Language and Cognition, *6*(3), 201-211. https://doi.org/10.1017/S1366728903001135

Dai, Z. H. (2011). A Study on Disfluency in Chinese to English Interpretations of Chinese EFL Learners. *Shanghai Journal of Translators*, *1*, 38-43.

De Bot, K., & Lowie, W. (2010). On the stability of representations in the multilingual lexicon. In M. Pütz & L. Sicola (Eds.), *Cognitive processing in second language acquisition* (pp. 117-134), Amsterdam/Philadelphia: John Benjamins.

Defrancq, B., & Plevoets, K. (2018). Over-uh-Load, Filled Pauses in Compounds as a Signal of Cognitive Load. In M. Russo et al (Eds.), *Making Way in Corpus-based Interpreting Studies* (pp. 43-64), Singapore: Springer.

Dong, Y., & Zhong, F. (2017). Interpreting Experience Enhances Early Attentional Processing, Conflict Monitoring and Interference Suppression along the Time Course of Processing. *Neuropsychologia*, *95*, 193-203. https://doi.org/10.1016/j.neuropsychologia.2016.12.007

Ecke, P. (2015). Parasitic vocabulary acquisition, cross-linguistic influence, and lexical retrieval in multilinguals. *Bilingualism: language and cognition*, *18*(2), 145-162. https://doi.org/10.1017/S1366728913000722

Fitzmaurice, S., & Purdy, K. A. (2015). Disfluent pausing effects on listener judgments of an ASL-English interpretation. *Journal of Interpretation*, *24*(1), 1-16. https://tigerprints.clemson.edu/languages_pubs

Fu, R. (2012). Pausing in two-way E-C consecutive interpreting: A contrastive analysis of trainee interpreters' performance. *Foreign Language Teaching and Research*, *44*(3), 437-447+481.

Fu, R. (2013). Directional effects on disfluencies in consecutive interpreting. *Modern Foreign Languages*, *36*(2), 198-205+220.

Fu, R., & Wang, W. (2016). Pausing in Chinese EFL learners' C-E interpretation: A corpus-based analysis. *Shandong Foreign Language Teaching*, *37*(2), 94-103.

Gile, D. (1995). *Basic concepts and models for interpreter and translator training*. Amsterdam/ Philadelphia: John Benjamins.

Goffman, E. (1981). *Forms of Talk*. Philadelphia: University of Pennsylvania Press.

Goldman-Eisler, F. (1958). Speech analysis and mental processes. *Language and Speech*, *1*, 59-75. https://doi.org/10.1177/002383095800100105

Goldman-Eisler, F. (1961). A Comparative Study of two Hesitation Phenomena. *Language and Speech*, *4*(1), 18-26. https://doi.org/10.1177/002383096100400102

Goto, M., Itou, K., & Hayamizu, S. (1999). A real-time filled pause detection system for spontaneous speech recognition. In *Sixth European Conference on Speech Communication and Technology*.

Green, D. (1998). Mental control of the bilingual lexico-semantic system. *Bilingualism: Language and cognition*, *1*(2), 67-81. https://doi.org/10.1017/S1366728998000133

Han, C., & An, K. (2021). Using unfilled pauses to measure (dis)fluency in English-Chinese consecutive interpreting: In search of an optimal pause threshold(s). *Perspectives*, *29*(6), 917-933.

https://doi.org/10.1080/0907676x.2020.1852293

Hieke, A. (1981). A content-processing view of hesitation phenomena. *Language and Speech*, *24*(2), 147-160. Retrieved from https://www.proquest.com/scholarly-journals/content-processing-view-hesitation-phenomena/docview/1299114660/se-2?accountid=13625

Housen, A., & Kuiken, F. (2009). Complexity, accuracy, and fluency in second language acquisition. *Applied Linguistics*, *30*(4), 461-473. https://doi.org/10.1093/applin/amp048

Iwashita, N. (2010). Features of oral proficiency in task performance by EFL and JFL learners. In M. T. Prior et al. (Eds.). *Selected Proceedings of the 2008 Second Language Research Forum* (pp. 32-47), Somerville, MA: Cascadilla Proceedings Project.

Jiang, X., & Hu, K. (2020). A corpus-based study of disfluency in the Chinese-English conference interpreting as an indicator of interpreter style. *Foreign Languages and Translation*, *27*(2), 11-17+4. https://doi.org/10.19502/j.cnki.2095-9648.2020.02.003

Kormos, J. (2006). *Speech Production and Second Language Acquisition*. Mahwah, NJ: Lawrence Earlbaum Associates

Kroll, J. & de Groot, A. (2005). *Handbook of bilingualism: Psycholinguistic approaches*. Oxford: Oxford University Press.

Kurz, I. (1993). Conference interpretation: Expectations of different user groups. *The Interpreters' Newsletter*, *5*, 13-21. http://hdl.handle.net/10077/4908

Lakoff, R. (1973). Language and Women's Place. *Language in Society*, *2*(1), 45-80. https://doi.org/10.1017/S0047404500000051

Lee, Y. (2014). Quantifying English fluency in Korean speakers' read-aloud and picture-cued storytelling speech. *Linguistic Research*, *31*(3), 465-490. https://doi.org/10.17250/khisli.31.3.201412.003

Li, H., Zhang, F., & MacWhinney, B. (2011). Examining Language Selection Mechanism in Bilingual Lexical Access. *Foreign Languages in China*, *8*(5), 25-32+39. https://doi.org/10.13564/j.cnki.issn.1672-9382.2011.05.004

Li, Y., & Wang, S. (2016). The Bibiometric Studies on China's Corpus-Based Interpreting Studies. *Journal of Beijing International Studies University*, *5*, 71-83. https://doi.org/10.12002/j.bisu.2016.063

Lin, Y., Lv, Q., & Liang, J. (2018). Predicting fluency with language proficiency, working memory, and directionality in simultaneous interpreting. *Front Psychol*, *9*, 1543. https://doi.org/10.3389/fpsyg.2018.01543

Liu, S., & Hu, A. (2012). A cognitive study on the access efficiency and operation mechanism of Vocabulary Translation: An Empirical Survey Based on different second language proficiency. *Chinese Translators Journal*, *33*(4), 24-30.

Lys, F. (2013). The development of advanced learner oral proficiency using ipads. *Language Learning*

and Technology, *17*(3), 94-116.

Maclay, H., & Osgood, C. (1959). Hesitation phenomena in spontaneous English speech. *Word*, *15*(1), 19-44. https://doi.org/10.1080/00437956.1959.11659682

Magnifico, C., & Defrancq, B. (2019). Self-repair as a norm-related strategy in simultaneous interpreting and its implications for gendered approaches to interpreting. *Target*, *31*(3), 352-377. https://doi.org/10.1075/target.18076.mag

Mead, P. (2002). Exploring hesitation in consecutive interpreting: An empirical study. In G. Garzone, & M. Viezzi (Eds.), *Interpreting in the 21st Century: Challenges and Opportunities* (pp. 75-82). Amsterdam/ Philadelphia: John Benjamins.

Miao, H. (2009). Pauses in L2 non-fluent oral production. *Journal of PLA University of Foreign Languages*, *32*(4), 56-60.

Piccaluga, M., Nespoulous, J., & Harmegnies, B. (2005). Disfluencies as a window on cognitive processing. An analysis of silent pauses in simultaneous interpreting. In *Disfluency in Spontaneous Speech*.

Pio, S. (2003). The relation between ST delivery rate and quality in simultaneous interpretation. *The Interpreters' Newsletter*, *12*, 69-100.

Plevoets, K., & Defrancq, B. (2018). The cognitive load of interpreters in the European Parliament: A corpus-based study of predictors for the disfluency uh (m). *Interpreting*, *20*(1), 1-28. https://doi.org/10.1075/intp.00001.ple

Pöchhacker, F. (2004). *Introducing Interpreting Studies*. London: Routledge.

Qi, T. (2019). Pause frequency characteristics of professional interpreter's English-Chinese simultaneous interpreting and their cognitive processes: A case study based on a small-sized corpus with dual modalities. *Foreign Languages and Their Teaching*, *5*, 135-146+151. https://doi.org/10.13458/j.cnki.flatt.004627

Qi, T. (2021). A Review on Interpreting Fluency Studies. *Foreign Languages Research*, *4*, 69-75. https:// doi.org/10.13978/j.cnki.wyyj.2021.04.012

Riccardi, A. (2002). Evaluation in Interpretation. In E. Hung (Eds.), *Teaching Translation and Interpreting* (pp. 115-126). Amsterdam/Philadelphia: John Benjamins.

Richels, C., Buhr, A., Conture, E., & Ntourou, K. (2010). Utterance complexity and stuttering onfunction words in preschool-age children who stutter. *Journal of Fluency of Disorders*, *3*, 314-331. https://doi.org/10.1016/j.jfludis.2010.06.001

Rosselli, M., Ardila, A., Araujo, K., Weekes, V. A., Caracciolo, V., Padilla, M., & Ostrosky-Solí, F. (2000). Verbal fluency and repetition skills in healthy older Spanish-English bilinguals. *Applied Neuropsychology*, *7*(1), 17-24. https://doi.org/10.1207/S15324826AN0701_3

Santilli, M., Vilas, M. G., Mikulan, E., Caro, M. M., Muñoz, E., Sedeño, L., Ibáñez, A., & García, A. M. (2019). Bilingual memory, to the extreme: Lexical processing in simultaneous interpreters. *Bilingualism: Language and Cognition*, *22*(2), 331-348.

https://doi.org/10.1017/S1366728918000378

Schmidt, R. (1992). Psychological mechanisms underlying second language fluency. *Studies in second language acquisition*, *10*(1), 91-138. https://doi.org/10.1017/S0272263100011189

Seleskovitch, D. (1978). *Interpreting for international conferences*. Washington, DC: Pen and Booth.

Shao, X. (2020). A Study on the Construction of English-Chinese Consecutive Interpreting Corpus. In *2020 Conference on Education, Language and Inter-cultural Communication (ELIC 2020)* (pp. 376-383), Paris: Atlantis Press. https://doi.org/10.2991/assehr.k.201127.076

Snellings, P., Van Gelderen, A., & De Glopper, K. (2002). Lexical retrieval: An aspect of fluent second–language production that can be enhanced. *Language Learning*, *52*(4), 723-754. https://doi.org/10.1111/1467-9922.00202

Snellings, P., Van Gelderen, A., & De Glopper, K. (2004). The effect of enhanced lexical retrieval on second language writing: A classroom experiment. *Applied Psycholinguistics*, *25*(2), 175-200. https://doi.org/10.1017/S0142716404001092

Song, S., Li, D., & Zha, J. (2021). An empirical and corpus-based study on the effects of input rate on fluency in simultaneous interpreting. *Foreign Language Research*, *3*, 103-108. https://doi.org/10.16263/j.cnki.23-1071/h.2021.03.017

Tannen, D. (1990) *You Just Don't Understand: Women and Men in Conversation*. New York: William Morrow.

Tissi, B. (2000). Silent pauses and disfluencies in simultaneous interpretation: A descriptive analysis. *The Interpreters' Newsletter*, *10*, 103-127. http://hdl.handle.net/10077/2455

Trouvain, J., Fauth, C., & Möbius, B. (2016). Breath and non-breath pauses in fluent and disfluent phases of German and French L1 and L2 read speech. *Proceedings of Speech Prosody*, *31*(SP8), 31-35. https://doi.org/10.21437/speechprosody.2016-7

Tymczyńska, M. (2012). Trilingual lexical processing in online translation recognition. The influence of conference interpreting experience. In D. Gabrys-Baker (Eds.), *Cross-linguistic influences in multilingual language acquisition* (pp. 151-167), Heidelberg: Springer.

Wang, B., & Li, T. (2015). An empirical study of pauses in Chinese-English simultaneous interpreting. *Perspectives*, *1*, 124-142. http://doi.org/10.1080/0907676X.2014.948885

Wang, J., Li, D., & Li, L. (2019). A study of pauses in EFL learners' interpreting based on PACCEL-S corpus. *Foreign Language Education*, *40*(5), 78-83. https://doi.org/10.16362/j.cnki.cn61-1023/h.2019.05.015

Wen, Q., & Wang, J. (2008). *Parallel Corpus of Chinese EFL Learners*. Beijing: Foreign Language Teaching and Research Press.

Xu, H. (2010). Pauses in Conference Consecutive Interpreting from English into Chinese: An Empirical Study. *Foreign Languages Research*, *1*, 64-71. https://doi.org/10.13978/j.cnki.wyyj.2010.01.007

Yang, C., & Deng, M. (2011). Interpretation Decision-Making Process of Experienced and Novice Interpreters. *Chinese Translators Journal*, *32*(4), 54-59.

Yang, J. (2004). A review of studies on disfluencies in speech production. *Foreign Language Teaching and Research*, *36*(4), 278-284. https://doi.org/ 10.3969/j.issn.1000-0429.2004.04.006

Yang, Y. (1996). Sex-and level-related differences in the Chinese color lexicon. *Word*, *2*, 207-220. https://doi.org/10.1080/00437956.1996.11435954

Zellner, B. (1994). Pauses and the temporal structure of speech. In E. Keller (Eds.), *Fundamentals of Speech Synthesis and Speech Recognition* (pp. 41-62). Chichester: John Wiley.

Zhang, Q., & Liu, S. (2011). The Mechanism of Lexical Selection in Bilingual Translating: *A Revised Model in the Light of the Language Selection Theory*, *125*(1), 38-46. https://doi.org/10.13978/j.cnki.wyyj.2011.01.011

APPENDIX 1. PACCEL-S 2007 TEM 8

Interpreting from Chinese into English

宏业高科技有限公司开业典礼致辞

尊敬的市领导，各位来宾，女士们、先生们：

上午好！

首先请允许我代表宏业高科技有限公司董事会和全体员工，向今天前来出席开业典礼的领导、嘉宾和新闻界的朋友们表示最热烈的欢迎！

宏业公司的今天，得益于各级领导和有关部门的关心、客户的信任、供应商的默契配合和合作伙伴的鼎力相助。而且，我们不仅拥有一流的硬件和软件，还拥有大量优秀的人才，磨练出一批精兵强将。许多优秀员工，有的放弃其他公司优厚的待遇、有的远离家乡和家人，忘我工作。同时，年轻的技术人员也在实践中迅速地成长，我们的产品开发和工艺完善等工作，就是由有经验的工程师带领年轻工程师共同完成的。他们的团队合作和创新精神，是宏业公司得以不断创新和发展的真正源泉。同时，也将是中国高科技产业腾飞的宝贵资源。在此，我也要代表董事会，感谢全体员工的努力与付出！

各位领导，各位来宾，宏业将会牢记使命，积极进取，为推进中国高科技产业的发展而不懈努力。谢谢大家！

Directions: Now listen again. Please begin interpreting when you hear a beep.

1.首先请允许我代表宏业高科技有限公司董事会和全体员工，向今天前来出席开业典礼的领导、嘉宾和新闻界的朋友们表示最热烈的欢迎！

2.宏业公司的今天，得益于各级领导和有关部门的关心、客户的信任、供应商的默契配合和合作伙伴的鼎力相助。

3.许多优秀员工，有的放弃其他公司优厚的待遇、有的远离家乡和家人，忘我工作。

4.我们的产品开发和工艺完善等工作，就是由有经验的工程师带领年轻工程师共同完成的。

5.他们的团队合作和创新精神，是宏业公司得以不断创新和发展的真正源泉。