國立臺灣師範大學文學院翻譯研究所

博士論文

Graduate Institute of Translation and Interpretation

College of Liberal Arts

National Taiwan Normal University

Doctoral Dissertation

速度放慢對於口譯學生的影響

The effect of slower speech rate on interpreter trainees

楊蕾

Lei Yang

指導教授：陳子瑋 博士

Advisor: Tze wei Chen, Ph.D.

中華民國一一二年七月

July, 2023

摘要

本研究希望探討口譯學生在速度放慢時的表現。前人研究顯示，在口譯過程中，講者語速為一大影響因素，如果語速過快，將會導致口譯員無法跟上，以致產生「漏譯」（omission）的現象。過去研究多數針對口譯員在講者語速加快之下的表現，並且針對專業口譯員及學生口譯員加以比較，但是目前未有研究針對較慢語速所帶來的教學影響，以及是否能幫助學生以漸進形式習得口譯技巧。本研究為了探討語速放慢時，學生口譯員的表現為何，邀請大專院校學生接受測試，受試者皆為修習初階口譯課程的外文系學生。研究者於一學期的課程中，分別施放三次實驗，語料皆來自課程內容，皆由英語母語人士擔任演說者。每段實驗音檔被分為四段，每一段大約一分鐘長度。研究者將第二段及第四段透過音訊軟體把速度放慢為原速的 75%，每次實驗皆在課堂中播放。結果發現，學生口譯員在速度慢時，漏譯誤譯等錯誤較少。在逐步口譯筆記的部分，學生在語度 120-140 wpm 區間較能以原文甚至是譯文記下筆記，及運用符號數字；在達到 160-180 wpm 語速時則較常運用原文，符號較少運用。本研究希望透過結果探討如果在口譯訓練中，速度降慢是否影響學生口譯員之產出表現，以及探討帶來之影響為何。本研究希望探討所得之結果能夠提供未來研究及教學實踐參考。

關鍵字：速度、口譯訓練、逐步口譯

Abstract

The purpose of this research is to explore the impact of slower speech rate on interpreter trainees. Past research studies have shown that speed is one of the main stressors for professional interpreters and students alike, causing interpreters to commit omissions. Past research studies focused on examining faster speech rates, but less studies have been done on the effect of slower speech rate. This paper focuses on exploring the impact of slower speed rates, and its impact on trainees' performance. The research included participants of college level students who were taking introductory consecutive interpreting training course. The experiment design was administered on 3 separate occasions over the semester. There were 3 experiments in total, each experiment is made up selected clips of original video materials. The recording was edited into 4 parts. The researcher manipulated the speed of the second and fourth part, slowing down the speed into 75% of its original speed. Analysis results showed that the students tend to omit entire sentences during original speed; while in slower speed (75%), students were able to retain more content. The result showed that they were able to retain more keywords during the slower segments, and this is our point of exploration for training purposes. In their CI notes, trainees were able to use TL more during the 120-140 wpm group, even with SL and symbols to aid in CI note cues too. But when the speech rate hot 160-180 wpm, trainees more so relied on SL exclusively, as well as less use of symbols or numbers. Through the process of gradual skill acquirement, students will be capable of focusing on training singular skills during their training process. Once the students are more acquainted with the process, instructors can gradually introduce original speed or even faster speed to the students. This study hopes to contribute to future training and speed related research of the field.

Keywords: speed, interpreter training, consecutive interpreting

Table of Contents

List of Tables

List of Figures

Chapter One   Introduction

The topic of speed has been of importance in the field of interpreting research. Speed being one of the major factors in influencing interpreter's performance or stress level (Barghout et al., 2005). Gile (2009) mentioned that by using The Effort Model, interpreter's capacity can be seen as composed of different Effort components, and once the capacity has reached its maximum, the interpreter's performance will start to deteriorate. Past research studies have shown that when the speed of the speaker picks up, the interpreters seemed to have difficulty keeping up (Gerver, 1976; Pio, 2003; Chang, 2005; Chiu, 2017). However, the majority of the past studies have been focusing on simultaneous interpretation; there were also studies showing that faster speed did not affect SI interpreter's performance (Shlesinger, 2003; Vančura, 2013), it seems that there needs to be more research into speed and its effect on interpreters. Given that consecutive interpreting plays an important role for trainees to train in order to become a future SI interpreter, it can be worthwhile to see with the use of slower speech rate materials, perhaps it will have a positive effect on the trainees while they were learning CI. Past prescriptive studies mentioned the consideration given into providing trainees with speech materials with adequate speech rates in the beginning of the training, but very few empirical studies have emerged reporting on the use of slower speech rates and its results (Gile, 2001b; Sawyer, 2004; Setton & Dawrant, 2016).

Until present, only a few studies related to speed have focused on CI mode, with trainees as their research participants (Ribas, 2012; Tai, 2020). However, these few past studies also focused on the effect of faster speed rates rather than slower speech rates. As most interpreters have pointed out, faster speed is a major stressor when performing their task (Neff, 2011), it would be worthwhile to observe the use of slower speech rates material and its effect on trainees.

Should the slower speech rates affect trainees, it remains to be seen if the effect to be a positive one or a negative one.

1.1 Research background and motivation

Interpreting as a task can be very taxing, whether in consecutive or in simultaneous mode since it requires the interpreter to manage and distribute their mental resources among different efforts (Gile, 2009). According to Gile's Effort Model, the difference between consecutive and simultaneous interpreting mode lies in the time lapse of the output. In consecutive mode, the interpreter's efforts can be split up into two phases, with the first phase focusing on listening, analyzing, and note-taking. The output phase will come in the second phase. This is different in the simultaneous mode, where the output already takes place in the first and only phase, as they do not have to take notes. To this distinction of interpreting with notes or without notes, scholars have found the disruptive nature of taking notes while listening and analyzing (Gile, 1999), due to the fact that there needs to be extra processing capacity being put into deciding what to put into notes, the processing capacity needed to the movement of taking notes, and the fact that writing as an action itself simply takes longer time than uttering the same speech segment, thus risk increasing the working memory load. Alexieva (1994, p.200) mentioned that the students upon learning the instruction and systems of note-taking, their performance remain consistently low for a comparatively long period. During this stage, note-taking leaning was characterized by "a weaker memory operational capacity". because most of the students' energy was spent on deciding what symbols, and deciding what to put in notes and what to put in memory.

Various studies have put effort into exploring factors that can contribute to the interpreter's capacity overload. Studies have found that faster speed rates can be a contributing factor to interpreter's deteriorating performance (Gerver, 1969; Pio, 2003). There was also an

interpreter's self-report mentioning that speakers speaking too fast can be the main stressor to perform (published in Association Internationale des Interprètes de Conférence in 2012, cited from Barghout et al., 2015). Though there have been studies on how does faster speech rate has impact on interpreters' performance, most of the research studies focused the impact of faster speed on the simultaneous interpreting mode. While it is necessary to discuss the negative impact of faster speed, the impact of slower speed have only been briefly mentioned in the past literatures, and was never the focus point of any research. When past research studies do mention slower speed, it usually talks about the memory load capacity that overwhelms the simultaneous interpreters when the speech rate gets too slow. Shlesinger (2003) mentioned that the professional simultaneous interpreters when encountered with speech segments with various adjectives following or preceding a noun, would rather choose to follow the speaker more closely when the speed rate picked up. In short, the faster speed rates did not a play a negative impact on their professional simultaneous interpreters' performance. Chiu (2017) found that with the simultaneous trainees experienced "memory decay" when the speed became too slow, meaning they started to lose track of what the speaker had said previously. The studies on faster speech rates showed that faster speech rates have negative effects on simultaneous interpreters, but few have looked into faster speech rates and its impact consecutive interpreting. Aside from the exclusive focus on the simultaneous mode, not many studies have focused on consecutive interpreting mode, let alone the impact of slower speech rates on trainees. Since the trainees struggle with note-taking and listening simultaneously at the beginning of the training, the result of a slower speech rate and its effect on the trainees during this stage has been overlooked by past researchers. Therefore, this study wishes to explore the pedagogical usage of slower speech rate materials on interpreter trainees.

The early study by Gerver (1969) that examined the effect of faster speech rates on simultaneous interpreters found that, not only did the performance of the interpreters would deteriorate as the speed picked up, but also that the Ear-Voice-Span (EVS) would also tend to lag further and further behind. Pio (2003) did a similar research based on the foundation that Gerver laid down, and found that though faster speed rates did negatively impact the interpreters' performance, the EVS itself was an individualistic preference, i.e., the EVS did not necessarily lagged when the speed picked up. Andres (2002) did a research study that was written in German, used video recording to study the CI notes of students and professionals working from French (B) to German (A). This study found that just by looking at the time span of interpreters listening and then putting pen to paper, Ear-Pen-Span (EPS), professionals take about 3 to 6 seconds while students will take up to 10 seconds. This demonstrates the overloaded capacity for the students during the first phase of CI (Andres, 2002, cited from Chen, 2016).

During the first phase of CI Effort Model (Gile, 2009) the interpreters need to listen, analyze, and take CI notes. The notes are particular to the task, and literatures throughout time have prescribed or described their results of the CI notes. Rozan (1956/2004), Herbert (1952) outlined the basic principles of taking CI notes and the difference it is from regular lecture notes. Other authors provided input as well regarding the training and principles of note-taking (Liu, 1994; 2008). Despite the systems being laid out, there are still difficulties for instructors and students when teaching and learning CI note-taking. Research efforts since moved to describe the phenomenon trainees have shown in CI note-taking. Dam (2004a) showed the results of trainees choosing A language to be their dominant note-taking language, regardless of the direction of the interpretating task; Dam found that it did not matter whether their A language was the source language or the target language. Later, Dam (2004b) presented the results of professional

4

interpreters choosing to use symbols more frequently and again, the preference to use A language to be the dominant note-taking language. Dam found that when the tasks become more difficult, interpreters would choose to use the source language. Given that Dam's two studies were based on CI between Danish and Spanish, with Danish being the participants' A language, it is worthy to question whether the results of Dam's studies can be applied to other language combination as well. Other authors such as Szabó (2006) and González (2012) also looked into how does language combination affect CI note-taking. Szabó (2006) found that despite trainees' have Hungarian as their A language, due to the nature of the language structure, the trainees would still opt to use English (B language) as their CI note-taking choice. Szabó (2006) had participants performed CI in both directions, and in both tasks the trainees showed consistent preference. González (2012) found that participants with Spanish as their A language will shift from using source language to target language as their level of expertise increased. However, González only asked participants to perform one direction of CI, from Spanish (A) to English (B).

When comparing slower speech rates and its impact on interpreters, Chang (2005) found that at 100 wpm, professional SI interpreters with either Mandarin or English as A language performed better than other faster speech rates and in both directions. Whereas in Chiu (2017), the simultaneous interpreting trainees have Mandarin (A) and English (B) found that at 100 wpm was too slow for them, and that the participants experienced "memory decay". With this particular language combination alone, it was found that slower speech rates had different results from the professional SI interpreters and SI trainees.

On the CI note-taking, Chen (2017) showed that professional interpreters with Mandarin (A) and English (B) based in Australia preferred English to Mandarin when taking notes, and this

is consistent with tasks in both directions. In their retrospective reports, it was noted that using English was easier to write than Mandarin. Tai (2020) found that CI trainees with Mandarin (A) and English (B) planned to utilize more Mandarin in their notes, as their tasks involved interpreting from English to Mandarin. It was reported by the participants in this study that they intended to use Mandarin so as to reach faster to the output stage. However, in Tai (2020)'s study, where speech rates were also involved, when the speech rate goes up, the trainees would revert to using English as their note-taking language.

CI note-taking is part of the analyzing and planning phase for the interpreters to organize and sift out the important segments of the speech (Liu, 1994). Therefore, instructors in the training phase would emphasize on the development of a system or principle for trainees to fall back on in the event of performing the CI task.

With consecutive interpreting considered as the training "stepping stone" for trainees to later learn simultaneous interpreting (Ilg & Lambert, 1996), this research hopes to present the results of slower speech rates and its impact on trainees, in order to shed more light on the process of interpreter training.

1.2 Research purpose

The purpose of this research is to explore and bridge the gap that previous researchers perhaps have overlooked, which is the usage of slower speech and its effect on interpreter trainees. The design of this study is never before seen in previous studies from two aspects: first, the experiments were carried out within the training environment of the trainees. The participants of this study were not asked to join the experiments seperately at a different venue, therefore, there is a higher likelihood of preserving the conditions that trainees encounter in class. Thus, the experiments were conducted in a more natural setting at least more familiar to the trainees.

Second, when looking at the previous studies on speech rates, almost all except for Rosendo and Galván (2019) seemed to have recorded their experiment materials with one speech rate for each clip. For example, in Chiu (2017), the participants were tested on 100 wpm, 130 wpm, and 160 wpm. For each speech rate, there was a different set of materials of the same theme recorded and played for the trainees. However, in order to gain a deeper understanding in the usage of slower speech rates and its effect on trainees, this study chose to change the speech rates "mid-clip", meaning that there were four different speech rates in one experiment alone. This was designed with the hopes to examine more clearly the effect of slower speech rate materials, be it negative, positive, or no effect at all. In addition, this would perhaps also reflect the effect of the change of speed and its impact on the student interpreters.

The current study included three experiments, the first one took place at the beginning of the training, the second one around the middle of the training, and the final experiment took place close to the end of the training. Each experiment contained four different segments, with two original speech rates and two slower speech rates interspersed. Thus, the sequence of the experiment for each segment was as follows: original, slow, original, slow. Such design was meant to track the performance of the trainees along with the change of speed rates, hence the focus is on the influence of the slower speech rates as a result, as well as the changing of speed rates. It was presumed that trainees will perform better during the slower speech segments of the experiments, and that they would perhaps notice the change of speech rates during the experiments and report that in the post-test questionnaire.

Therefore, this study attempts to find answer to the two following questions:

Q1. How does the use of slower speech rate materials have an effect in interpreter trainees' output?

Q2. How does the different speech rates affect trainees' CI note-taking preferences? If so, what is the outcome?

Chapter Two Literature Review

2.1 What is Interpreting?

As early as the 1960's, Kade (1968) mentioned that interpreting came from translation, in that they are both exchanging ideas between source text and target text, but interpretation is different in that the source language is only accessible within a limited amount of timeframe. Meanwhile, the time allotted for producing target speech text is also time limited. In short, the major difference between translation and interpretation lies in the factor of time. Another very salient difference is that due to the time constraint, there is almost little to no chance for the interpreter to correct their errors or retract what they have interpreted (cited from Pöchhacker, 2016, p.10).

2.1.1 What is Consecutive Interpreting?

Consecutive interpreting is one of the two modes of interpreting under conference interpreting. The other mode is simultaneous interpreting. Consecutive interpreting involves the speaker speaking for a certain length of time, with the interpreter listening and taking down notes, and then relay the message in another language to the target audience.

While nowadays simultaneous interpreting has become a more popular mode of conference interpreting, provided that the organizers are able to coordinate the logistics and the technical equipment that SI needs, Weber (1984) mentioned that there are situations where it was considered more ideal to use consecutive interpreting. In situations such as conferences and conventions where the requirement for accuracy is considerably higher, for example, legal negotiations and high-level official talks. The main advantage for consecutive interpreters in these situations, when comparing with simultaneous interpreters, is that they are able to have more time to reflect on the content of the message.

Realistic situations and clients' need aside, there are also pedagogical concerns regarding the importance of consecutive interpreting (Ilgs and Lambert, 1996; Gile2001b). Instructors of the field would advocate that consecutive interpreting presumably have a different cognitive processing sequence when compared with simultaneous interpreting. In the upcoming sections, this study will explore models designed to describe the CI process (Consecutive interpreting model), and the pedagogical implications (Gradual skill acquisition).

2.1.2 Consecutive Interpreting Model

In the early attempts of trying to understand the process of consecutive interpreting, there were basic stages of working process brought up such as Wang in 1987 mentioned that the consecutive interpreting process involves three stages (cited from Liu, 2008): listening and comprehension, writing down notes, and producing output. This was a basic and rudimentary view at the process of interpreters at work, but it also provided a starting point to look into the process. Later on, Weber also brought up the different stages of the consecutive interpreting model.

2.1.2.1 Weber's CI Model

As early as Weber (1989) has mentioned that the training of interpretation consists of components that can be seen as automated muscle memory, and those that are not to be seen as automated processes.

His idea came from teaching as an instructor at the MIIS, there are 5 phases to the consecutive interpreting process: hearing, listening, analyzing, memorizing/note-taking, and finally, interpreting. He believes that it is possible through training in the program that these actions will become repeated enough for the students to attain a sort of "muscle memory". He describes this process as being an automated state, and there are additional 5 phases of actions

related to consecutive interpreting that can be automated: public speaking, hearing, listening, analyzing, memorizing/note-taking.

The 5 phases of consecutive interpreting process:

1. Hearing: To be able to hear incoming message.

2. Listening: To be able to selective listen to the incoming messages.

3. Analyzing: To analyze the main points in the message, and this phase largely overlaps with the previous phase, listening.

4. Memorizing/note-taking: the interpreter needs to make a conscious choice which words to note down and which words they should choose to commit to memory instead.

5. Interpreting: The final phase of presenting the messages to the audience. The more effort that the interpreter has put into the previous phases, the more effortless and automated this phase will be.

The 5 phases of automated "muscle memory" process:

1. Public speaking: of course, it is crucial for the interpreter to harness the skills of becoming a decent enough public speaker in order to convey their message clearly for the audience to receive, in this sense, Weber is more talking about the etiquette of a speaker on stage. To be eloquent and mindful of the audience. Hence, the need to overcome stage-fright and be ready on stage.

2. Hearing: Weber stated the immediate reaction needed from the interpreter to be able to detect incoming message in the source language.

3. Listening: The ability to maintain focus on an orally delivered speech for a long period of time.

4. Analyzing: Weber stated that this is the part that is harder to train, this is something that each individual will have to train and practice on, and this is a phase where it is less automated, not a one-size fit all, but more of a skill to tailor oneself to the situation at hand. This phase often overlaps with the listening phase, hence reason why this phase is more difficult to automate.

5. Memorizing/note-taking: Weber maintained that this is something that requires for the individual to develop their own system, there is no need to follow a set rule, or adhere to a rigid system.

With Weber (1989) 's five stages of consecutive interpreting, the major emphasis was on the "automation" of the process. He compared such training and practice as muscle memory being repeated to such a point that certain tasks within the stages can become relatively effortless. Weber also believed that it was the final stage of the output production which is significantly different than the rest of the stages, since the other stages were working together at the same time.

Weber (1989) provided an initial look into providing the theory model of the CI working process, later on other authors such as Liu (2008) and Gile (2009) also provided their input as to the theory model of CI. The two researchers brought up new perspectives of viewing the consecutive interpreting process being divided into two different phases.

2.1.2.2 Liu's CI model

One aspect of CI that researchers seem to agree on is the importance and the difficulty of consecutive notes and how taxing it is for the interpreters. In fact, the seminal work by Rozan (1956/2004) is regarded as one of the representative works discussing the principles of note-taking and system developing.

Liu (2008) was a guidebook focusing on how to train students on CI skills and produce

adequate notes for practicing consecutive interpreting, specifically dedicated to students with the

language combination of English and Mandarin. Through drawing reference from the seminal

guide book by Rozan in 1956 as an introduction to how are consecutive notes systematically

practiced and trained, Liu also combined their in-the-field teaching experiences in describing the

issues that may occur, and the strategies to cope.

Liu (2008) provided intro about the idea of the guide book, as well as the underlying

theory and structure by quoting Wang (1987):

"that it was thought that the consecutive interpreting process is divided into three stages:

listening and understanding, note-taking, producing output" (Liu, 2008, p.28).

Liu then further developed their own model for consecutive interpreting:

1. Listening

2. Analysis and comprehension

3. Short-term memory operations and/or note-taking

4. Remembering and/or note-reading

5. Production

Liu (2008) also divided the five different work stages into two different phases: the first

phase consists of listening, analysis and comprehension, and short-term memory and note-taking;

the second phase consists of remembering and/or note-reading, and production. Liu believed that

Weber (1984)'s model put more emphasis on the first few stages, i.e., listening and analyzing,

note-taking and so on. When the interpreters arrive at the fifth and the final stage, there is only

one thing left to focus on, which is to produce the output. According to Liu, this would exist only

in an ideal situation, and would be quite fitting were the interpreters were interpreting into their native language or A language. However, if the interpreters were in a situation that requires them to interpret into their B language, this poses a greater demand on them during the fifth and final stage. Hence, Liu made an adjustment to Weber's model, further differentiating the components involved in the final stage. While Weber grouped them altogether under "Production", Liu chose to add "remembering and/or note-reading" along with "production" to the final stage of the working process.

Gile (1991, 2009) also provided perspective on the CI model, both Gile (2009) and Liu (2008) seemed to think that the first phase of consecutive interpreting is the most taxing and requires the most intensive efforts from the interpreters. Starting from actively listening and analyzing the incoming message, and switching between quickly writing down notes.

2.1.2.3 Gile's CI Effort Model

With Weber (1989)'s model to sketch out the process of consecutive interpreting, especially concerning the areas where there are multiple layers of effort that the interpreter experiences an "overlap" of the different stages, i.e., listening and analyzing and taking down notes at the same time, other researchers started looking into other field of knowledge, hoping to broaden the understanding the interpretation process.

Mackintosh in 1995 stated that during the 1970s, interpretation research attempts centered on the characteristics of the interpreting process, such as word count and the use of pauses. By the 1980s, researchers in attempts to broaden the scope, have turn toward areas such as communication-information processing models for a description of the interpreting process, which underpinned the studies done by researchers such as Gile.

Gile in 2009 stated, the formulation of the Effort Model stemmed from two intuitive ideas, one has to do with the limited capacity that the interpreter possesses, the other has to do with the deterioration process, which happens when the external task or challenge exceeded the interpreter's capacity. This led to Gile looking into short-term memory related research studies, as well as engineering theories related to communication, both of these sources help shaped The Effort Model.

The original Effort Model focused on describing the simultaneous interpreting process. The Consecutive Interpreting Effort Model is derived from the SI Effort Model. In Gile's words, the Consecutive Interpreting Effort Model consists of two phases: the listening and analysis phase and the reformulation phase. There are several components to the model:

L: Listening and analysis

N: Note-taking

M: Short-term memory

C: Coordination

The first phase of the model: listening and note-taking

- Interpreting = L + N + M + C

It is important to note that in this phase of production, the product is the consecutive notes; whereas in the Effort Model for simultaneous interpreting, their output takes place right here and ends here. Consecutive interpreters will instead move on to the next phase.

The second phase of the model: target-speech production

- Interpreting = Rem + Read + P + C

Rem: remembering

Read: reading the notes

P: Production

The second phase according to Gile (2009) is less taxing than the first phase, the most important component at this juncture is to "read" the notes taken down during the first phase of the Effort Model and "remember" the details or info attached to the notes. With the success of retrieving the information from their working memory, the interpreters are able to reform the message into the target language and produce an output. Besides the successful acts of completing the interpreting tasks, there are many variables that may contribute to the interpreter not being successful in providing a comprehensive output. Gile (2009) mentioned two types of failure sequences:

1. Momentary attention deficit:

Temporary missing out on names, specific nouns. For example, in an experiment conducted with 15 professionals, they were asked to interpret a speech containing 8 names, a simple name such as "Jim Joseph" elicited very low correct rendering due to the brief lapse of attention (Gile, 2009).

2. Insufficient availability of processing capacity for an Effort:

When interpreters devoted too much processing capacity into one of the Effort components, causing other Effort components lacking in capacity. For example, the translation of a long name such as "Association internationale des villes francophones de congrès" into English would cause the interpreters to consume more processing capacity in reordering or restructuring the original source text into target text (2009, p.172).

Aside from the central processing capacity limitations, Gile (2001a) listed potential problem triggers for the consecutive interpretation:

1. During the first phase of the consecutive interpreting working process, it is the most intensive and the most taxing on the interpreter's processing capacity.

2. When compared with simultaneous interpretation, even though consecutive interpretation is not as demanding in terms of producing immediate output, but the note-taking process is especially difficult for the interpreters to perform. And Gile found that the time lag between speech utterance and production output can cause two types of errors for consecutive interpreters:

1. Due to note-taking causing time lag, certain info segments when not noted down may be lost to the interpreters. Hence there is a chance for consecutive interpreters to omit info when notes are not complete for the task.

2. Enumeration. When the timeframe is considered with the note-taking time lag, certain enumerations may be lost in consecutive mode. Whereas in simultaneous mode they are able to handle the enumerations moment by moment as they come.

When it comes to CI specifically, Gile (1999a, 1991) stated it can be predicted that the consecutive note-taking can have certain disruptive effect for novice trainees:

1. Interpreters need extra processing capacity to make decisions about what to note down.

2. Writing as a physical action in itself can involve extra processing capacity as well.

3. Writing down notes simply just takes more time than producing an utterance in simultaneous interpreting.

What is important to note here is what Gile mentioned about the novice trainees, and that the note-taking process is considered as a "disruptive" experience in the beginning. The participants of the current study were also inexperienced trainees who have never received any

form of interpreting-related trainings before, let alone possessing a developed note-taking system and/or coping strategies. It will be interesting to see in this study trainees' performance under different speech rates while developing their burgeoning skills of consecutive note-taking.

The above mentioned models are meant to describe the working progress of consecutive interpreters and to better understand the potential obstacles or problem triggers trainees might encounter, as well as develop better strategies to counter the challenges. On the physical and temporal side, the physical effort and time cost associated with note-taking are of great concern to consecutive interpreters (Alexieva, 1994).

2.2 CI notes

The consecutive notes serve as the keystone for consecutive interpreters in order to complete their tasks. Various studies in the past have adopted the prescriptive view in terms of notation techniques such as symbols, links, utilizing segmentation and space on paper (Herbert, 1952; Rozan, 1956/2004; Washbourne & Gillies, 2017), mentioning that there is no steadfast or set-in-stone method that is applicable for everyone. In other words, authors tend to agree that the CI notes is a highly personalized individual system that needs to be developed through practice and training (Weber, 1984; Ilg & Lambert,1996). It is well recommended throughout literature that interpreters should utilize symbols, abbreviations, and language features to the interpreter's advantage (Rozan, 1956/2004; Herbert, 1952).

2.2.1 CI Notes Studies

Aside from the technique and skills, early theoretical background analyzing the CI notes comes from Seleskovitch's idea of "deverbalization", which entails the interpreter to capture the ideas or the essence of the incoming message itself, while removing the structure of the source language text completely. Seleskovitch believed that the "deverbalization" process would help

the interpreters become free of the influence brought on by the source language text structure, which has been a main factor in impeding the interpreters' ability to search for adequate target text product (Seleskovitch, 1975, cited from Albl-Mikasa, 2008).

As Gile (2006) have stated, during the 1980s, it was called "The Practitioner's period" with practitioners or instructors such as Seleskovitch leading the way in the interpretation researching field. During this time period, many issues were discarded as it were not deemed as concerns by the practitioners. Potential issues that could be related to the language combination was also disregarded at the time. Only after this time period has passed, more and more researchers explore the issues that may occur specifically with certain language pairs, i.e., English and Mandarin.

In 1994, Liu (1994) published a prescriptive-oriented study on the preparatory training for CI novice students. In the study Liu illustrated the issues that beginners may encounter specifically with the English and Mandarin language combination. Drawing heavily on their own instructing experiences, Liu (1994) was one of the first researcher that looked into the specific language combination, and highlighted the issues that are caused by the different language structure between English and Mandarin. Later on, Liu (2008) also further on their works with more detailed instructions on how to enhance the skills of English and Mandarin CI notes.

In terms of the theoretical implications to explain and examine the CI notes process, Albl-Mikasa (2008) also provided input in their study by re-examining the "deverbalization" theory brought up by Seleskovitch. The author divided research studies into "pre-cognitive" theory research studies, and present studies that are more readily receptive to incorporate other fields of knowledge in order to better understand the process of CI note-taking. Most notably, the author drew heavily on linguistics pragmatics and cognitive communication theory. Going back

to Seleskovitch's 1975 "deverbalization" theory, Albl-Mikasa explains that the main issue with it is that although the emphasis is on capturing the idea, and encouraging the CI interpreters to shake off the influence of the source language text structure, but it was unclear as to what exactly does that entail. In other words, there was no explicit steps to operationalize this "deverbalization" process. Washbourne and Gillies (2007) also mentioned the difficulty of trying to elaborate the concept of "deverbalization":

"The most often repeated thing you will hear as a student interpreter is 'note the ideas and not the words!'. But what is an idea? …This question is a little too metaphysical for this type of book …" (2007, p.38).

Alba-Mikasa used the pragmatics theory as an approach to examine the CI notes not only at the linguistic level, but from a propositional level, this allowed more understanding into what was noted and what was left out during the interpreting notation process. Furthermore, by borrowing from Wilson (2002)'s Relevance Theory, Alba-Mikasa utilized the explicature at the micro-propositional level and the implicature that follows to demonstrate the notation process. Albl-Mikasa stated there are two main strategies that interpreters use during notation phase: elliptical and restructuring. The elliptical strategy means that some of the source text language words are omitted and some are selected to be transferred. The restructuring strategy means the that interpreter will replace source text structure with non-source text structure, and some degree of detachment may emerge from this process.

In sum, Albl-Mikasa stated that interpreters do not necessarily deverbalize in the sense that Seleskovitch described, but rather, interpreter's notation reflects close parallel to the source text proposition structure. Micro-propositional processing and a form-based perspective toward note-taking can be more helpful to the notation process, even it goes against what past instructors

advise, to detach from the surface structure. There are reasons as to why interpreters would operate on a lower propositional level:

1. While the during the process of the notation, the interpreters do develop deep understanding and construct a mental model, but when it comes to the reproduction phase, the interpreters would still have to revert back to the propositional level, which is based on the notation, and then express the conceptual output.

2. The interpretation task itself is benefited more from a less elaborated mental representation. This is because the deeper construction of the mental modal is more beneficial for long-term learning and memorizing facts for long-term basis. But when it comes to recalling details and information from short-term memory, and in the attempt to avoid losing source text input, operating on a propositional text level would be more appropriate and more helpful.

3. Interpretation does not necessarily mean transferring one culture to another, but are experts discussing matters against a shared social and technical background (Pöchhacker, 2004 p.242), hence the target text is not independent, but always closely related to the source text. When in note-taking, it is useful to rely on the close interaction between the propositional structure and the surface structure. If there was a match between the propositional and the surface structure and the retrieval cues such as the memorized chunks or units, it will result in better overall retrieval results for the interpreter.

2.2.2 CI notes preferences

Aside from the theoretical implication behind the CI notes, past research studies also discussed the various elements that comes into note-taking: the quantity of the notes to be taken down, the completeness or the brevity of the note units, the form or symbols to be used, and last of all, the language that the notes should be taken in. Among all of the topics discussed, the

language which CI notes should be taken in garnered much discussion. Some scholars advocate for taking the notes in target language text (TL) (Herbert, 1952/2004; Rozan, 1956/2002; Seleskovitch & Lederer, 1989), while others argue for taking notes in source text (SL) (Liu, 1994; Giles,1991, 2009).

The camp that advocates for TL as note-taking units, such as Seleskovitch, believes that the interpreters should be able to process the meaning of the incoming source text and strip away the source text structure as they take down the CI notes. The SL camp, such as Gile, describes the interpreting process as extremely taxing in terms of the amount of capacity it requires for the interpreter to complete in just the first phase, the listening and comprehension phase. In such, Gile thinks that interpreters should note down the SL units during the first phase, and delay the production of the TL to the second phase (Gile, 2009).

When it comes to specific language combination prescriptive instructions, i.e., English and Mandarin, Liu (1994) advised that students do not use target text as notation text, similar along the lines of what Gile mentioned, explaining that the concurrent actions of listening and analyzing as well as taking down notes is already difficult enough for novice trainees, if the notational units were to be in TL, this would add on additional processing effort on the students, due to the grammatical structural differences between the two languages, English and Mandarin, especially when they are not yet familiarized with the process yet.

Chuang (2008) provided a more empirical based study on the linguistic and processing issues required in the CI task. The study involved twelve novice trainees who have completed eight weeks of training. All the trainees have Mandarin as their A language and English as their B language. The study administered three tests in class, asking the participants to perform CI from English into Mandarin in the attempt to examine their note-taking strategy and skill. The

results showed that the majority of the participants would choose to retain keywords from the source text (English, B language) and save it later for processing. When it comes to linguistic features, some participants would even use Mandarin phonetic symbols to represent the message, which is a feature idiosyncratic of traditional Mandarin language for the participants to take advantage of. Chuang concluded that the distinction between the successful notes and the rest is the fact that the interpreter took the effort to plan ahead when using their note-taking strategy. Whereas the less successful ones tended to invent new symbols representing messages on the spot, resulting in its inability to assist them in recalling during the reformation stage.

Other researchers also looked into the choice of language with empirical study methods. Dam (2004a) studied four student trainees as participants, three of which had Danish as A language and Spanish as B language. The one remaining participant had the inverse combination, with Spanish as A language and Danish as B language. The study asked the participants to complete consecutive interpreting in both directions, from Spanish to Danish, and from Danish to Spanish. Results showed that the participants had a strong preference in using A language as their noting unit. Thus, Dam concluded that perhaps the topic of choice of language needs to be considered from two perspectives: SL vs. TL, and the A-B language combination of the interpreters themselves. Dam (2004b) further the research later on in terms of exploring the additional variable of using symbols into researching CI notes. In this study, however, the source text was in Spanish, and the task was to complete CI into Danish. The five professional interpreter participants had the language combinations of Danish as A language and Spanish as B language. The results showed that the participants preferred to use target text (which was the participants' A language) overall when taking down notes.

Szabó (2006) also examined the CI notes taken with the language combination of Hungarian and English. The study recruited eight student trainees as participants, all had Hungarian as A language and English as B language. The tasks included consecutive interpreting of both directions, from Hungarian to English and vice versa. Results showed that the participants predominantly used English as their note-taking language. It was presumed this was due to the linguistic differences between Hungarian and English. Szabó explained that generally speaking, Hungarian language tend to be longer, due its prefixes and suffixes are attached to the words. In the post experiment questionnaire, when student trainees were asked about the choice of language, several reported that they did intend to use TL as the note-taking language, but when there are extreme factors such as lexical difficulty involved, it seemed that participants of this study resorted to the language that they feel can be more concise on paper. This sentiment also demonstrated the participants' intentions versus the actual outcome, i.e., choosing to use TL but resorting to English nonetheless.

Tai (2020) in their unpublished master's thesis also examined the choice of note-taking language when trainees are encountered with faster speed. The tasks involved the participants to complete CI from English (B language) to Mandarin (A language) in two different speed rates. The results showed that when encountered with faster speed, the majority of the participants adopted SL (English, B language) over TL (Mandarin, A language). Similar to Szabó (2006)'s result, the participants answered in the subsequent questionnaire that they also intended to adopt TL (Mandarin, A language) in order to streamline the reproduction phase faster and smoother. Again, echoing Szabó (2006)'s participants' sentiments, the gap between the intention and the actual outcome is quite clear.

González (2012) also examined the choice of language in note-taking across different levels of expertise. The study included three groups of participants: novice trainees, advanced trainees, professional interpreters. All participants had Spanish as A language, and English as B language. The tasks involved were performing CI from English(B) into Spanish(A). Results showed that as the level of expertise increases, the more CI notes would be taken in TL (Spanish, A language). This study revealed that novice trainees are still closely attached to the SL text (English, B language), while the professional interpreters were already capable of transitioning during the listening and analyzing phase.

Chen (2017) also looked into professional interpreter's choice of language through the use of smart pens and tablets to record the timing and strokes of their notes. The study included 5 professional interpreters accredited by the Australia's National Accreditation Authority for Translators and Interpreters (NATTI). All the participants' language combination were Mandarin as A language and English as B language. The study utilized the smart pens to record the end of speech sound segments and the start of pen sounds. This is the "ear-pen-span" calculation by the author. The tasks involved the participants to complete CI tasks in both directions, from English to Mandarin and vice versa. The study categorized the notation units into the following: symbol, language, and number. The language category was further divided into two subcategories: full word or abbreviation, using Mandarin or English. The results showed that the participants had a strong preference on using English as the note-taking language choice, with the statement from the retrospective report that "English was easier to write than Mandarin". Chen also stated that this result was contradicting to what Dam (2004a) had found, where the student trainees preferred to use their A language, Danish, when completing CI tasks working between Danish and Spanish. Chen also mentioned that the result was similar to Szabó (2006)'s findings, where

the economy of note-taking, i.e., to find the fastest way to scribble down notes, was the top priority. As previously mentioned, Szabó (2006)'s participants worked between Hungarian and English, with Hungarian being the participants' A language, and yet they still preferred to use English as note-taking language no matter which direction they were to perform CI in. So far, Szabó (2006), Tai (2020), Chen (2017) have used different means and methods to show how different language combination that the interpreters possess may have influenced their choice in the matter of note-taking language.

When it comes to using smart pens or technology to help better understand the CI note-taking process, Andres (2002) would probably be deemed as the pioneer in this regard. As Setton and Dawrant (2016) and Pöchhacker (2004) have mentioned, Andres's experiment included video-recording 14 students and 14 professionals taking notes from a speech. The participants' language combination was German as A language and French as B language. Their task was to interpret the speech from French (B) into German (A). The recording of each participants' process was measured in seconds, counting the exact second which speech element was spoken, and which second the unit appeared on the notepads, and interpreted by the interpreter. The study compiled the scripts of the original speech and the transcripts of the interpretation on the same sheet of paper, with the notes in between, thus providing an easier visualization process to examine and evaluate the performances. Andres's calculation of ear-pen-span begins with the start of the speech utterance, and the start of the pen writing, which is different from Chen (2017)'s calculation of counting from the end of the utterance and the start of pen. Andres found out that the ear-pen-span variability accounts for the time needed for interpreters to fully comprehend the incoming message. This lag may vary upon individual habits and preferences, but once the EPS lags over 7 seconds, omissions would start to occur at a higher rate. Through

the painstakingly detailed process (as described by Setton and Dawrant, 2016), Andres found that both students and professionals tend to use SL more (French, B language), but the professionals included quite a number of elements in TL (German, A language), and even in English as a third language (cited from Gonzalez, 2012, p.57)

When it comes to CI note-taking preferences, or the answer to the question of what is the best practice, so far there is no exact answer as the results shown from past research studies seem to differ based on the participant's language combination. Szabó (2021) mentioned the importance of research studies conducted on different language combination, and that Chen (2006)'s review help uncovered some of the English-Mandarin combination based research studies that were originally written in Mandarin. However, Szabó (2021) did not mention that Liu in 1994 provided a prescriptive-oriented study based on their instructing experiences with English-Mandarin combination trainees, with the study written in English. Also missing was Tai's 2020 research study, in the form of unpublished master's thesis written in English, dedicated specifically into CI trainees and their note-taking strategies, also written in English. In conclusion, there remains much room to explore in terms of CI note-taking, but upon examining past research studies related to CI notes with Mandarin (A) and English (B) as participants' language combination, it seems as though the participants would adopt English as their main note-taking language, presumably due to time constraints or related concerns (Chuang, 2008; Chen, 2017; Tai, 2020). As the current study also recruited participants with the Mandarin (A) and English (B) language combination, this study also wishes to find out if the results align with past research studies or not.

2.3 Speech Rates Related Studies

Conference interpreting is a taxing process, and there are various factors that are involved in the process that compounded to the difficulty of the task, such as speaker's speech rate (how fast the speaker talks), speaker's accent, topical knowledge, clarity of sound on site, ability to see the speaker on stage etc. As early as 1968, in a high-level conference in Alpbach on the topic of "Interpreters and Interpreting" discussed about the various issues that interpreters encounter, speed and input rate was given special attention due to its immediate impact on the performance of simultaneous interpreting (Alpbach, 1968, as cited in Pöchhacker, 2016). The Association Internationale des Interprètes de Conférence (AIIC), which is an organization that is dedicated to the standards and professionalism of interpreters and translators, released a report in 2012 stating that one of the main stressors perceived by interpreters. More importantly, fast speed ranks first among the main stress factors for interpreters (as cited in Barghout et al., 2015, p.307).

Subsequent research studies focus on the impact of faster speed on the performance of interpreters. Gerver (1969) was one of the first pioneer studies that began to examine the effect of faster speech rate on professional simultaneous interpreters. In the study, there were 10 professional interpreters divided into two groups, one group took on the simultaneous interpreting task, the other group took on the "shadowing" task. Shadowing meant to repeat what the speaker has said right after the speaker started talking. The language combination was from French to English. All of the participants' mother tongue was English, with it being their A language, while French might be their B (second) or C (third) language. Gerver compared interpreters with shadowers to present the result, and found that interpreters tend to lag further and further behind once the speech rate increased, and that once the speed increased to a faster rate (there were 5 different speech rates: 95 wpm, 112 wpm, 120 wom, 140 wpm, and 164 wpm.

164 wpm being the fastest in this study), the interpreters would commit more "omissions" among all other assessment categories. Gerver also found that when comparing the two groups, the ear-voice-span[1] (EVS) tended to lag further and further with the interpreters' group, while not as much in the shadowers' group. Gerver's study gave a foundational view of the working process of the simultaneous interpreters. In particular, Gerver found that interpreters work on a deeper level of comprehension by dealing with "phrases", whereas shadowers work on a surface level of "words" only.

Continuing on with Gerver's work, Pio (2003) compared the results from student simultaneous interpreters and professional simultaneous interpreters under faster rate. The language combination was from German (B or C language) to Italian (A language). German being the participants' B or C language. There were two different speech rates in the study, one faster at 145 word per minute (wpm) and the slow one was at 108 words per minute (wpm). The study also included syllables count for both speeches, the faster speech contained 302 syllables per minute, while the slow one contained 196 syllables per minute. Pio found that faster speech rate does have a negative effect on the interpreters, resulting in both groups committing more omissions as speech rate increases and the student interpreters were affected the most. However, contrary to what Gerver (1969) found that when the speech rate increased, where the interpreters' EVS would only increase, resulting in the participants lagging further and further away from the speaker, Pio did not find the same result in their groups of participants. Pio concluded that EVS length is perhaps an individual choice for the interpreters, should they choose to lag further or catch up with the speaker. Pio's study also helped highlighted the

---

[1] Ear-voice-span, or EVS, refers to the time lag between when the speaker starts to talk and the moment the interpreter begins their output.

difference between student interpreters and professional interpreters. Students made more filled

pauses than professionals (utterances such as "ugh", "um", and "eh"). Students also made more

repetitions than professionals, and this happened more frequently in slower speech rate. In faster

speech rate, the student became less fluent due to excessive use of filled pauses, corrections, and

unfilled pauses.

Meuleman and Van Besien (2009) studied 16 professional simultaneous interpreters'

performance under extreme conditions. One of the extreme conditions was faster speech, which

was a passage being read at 184 wpm. According the strategies that the participants adopted, the

interpreters can be divided into three groups: 1) the group that chose "tailing" the speaker as

much as possible; 2) the group that chose to "restructure" the sentences from the beginning; 3)

the group that did not adopt any strategy at all. Results showed that the "tailing" strategy was

most successful in this study with French (B) in Dutch (A) language combination. Only one

participant from group 2 was able to complete the task through "restructuring". From their study,

Meuleman and Van Besien helped formulated suggestions for future training purposes. They

suggested that for training purposes, it might be worthwhile for trainers to note that both

"tailing" and "restructuring" are effective strategies, since they are both strategies adopted by

professional simultaneous interpreters to use.

Ribas (2012) compared questionnaire responses from two groups of participants based on

their length of training. One group consisted of 8 novice students, and the other included 7

advanced students. The language combination was English (C) into Spanish (A). The study

found that during the first two phases of CI, which is listening and analyzing, and note-taking,

speed of delivery was one of the most important factors for both groups of participants. Ribas

included the speech used in the experiment, but the speed rate of which was not mentioned. In

coping with the issues occurred, advanced students tend to apply omission and summarizing to circumvent the problems; the novice students tend to use generalize, omission, and using common sense. Ribas concluded that the main difference between the two groups lied in that advanced students were more aware of strategies usages, whereas novice students did not mention as much in their responses. It is interesting to see the student interpreters' views on the difficulties they encounter, especially from the standpoint of trainees during the different stages of their training, however, it would have been even more insightful should the study provided an analytical outcome of how well the participants actually did in the experiment. In other words, aside from the qualitative results from the trainees' responses, the result would be more complete if their performance were assessed and presented in the paper.

Korpal (2012) examined whether professional interpreters and student interpreters are aware of the pragmatic aspects of consciously using omissions as a strategy to be more concise. The participants' language combination was English (B) into Polish (A). Korpal hoped to bring in new perspectives in terms of the issue of omissions in simultaneous interpreting. Korpal mentioned that in the past, omissions tended to be viewed only as a type of error, disregarding the possibility that this phenomenon could be a "deliberate decision" done by the interpreter in order to be more concise, or to avoid the needless repetitions that were in the source speech. Korpal used two English text material in the experiment, the speed rates of the both texts were manipulated with the use of Audacity software (freeware on both Mac OS and Windows) to produce a slower speed and a faster speed. Hence there were four speed rates in total as a result of the manipulation (Table 2.1).

Table 2.1 Delivery-speed versions of the texts from Korpal (2012)

	Fast	Slow
Text 1	2 min 48 sec	3 min 48 sec
	177 wpm	130 wpm
Text 2	2 min 51 sec	3 min 56 sec
	180 wpm	130wpm

Korpal specified two hypotheses in their study:

H1. There exists a positive correlation between the delivery rate and the number of omissions made. This means that the faster the speech rate, the more omission errors would occur.

H2. Both groups differ significantly in terms of the use of omission and they do not share the same view regarding using omission as a form of strategy.

Results showed that there was a positive correlation between delivery rate and number of omissions from student interpreters. With the professional interpreter group, there was no statistically significant difference in the score of omissions, whether in the slower speech rate nor in the faster speech rate. Therefore, Korpal's first hypothesis was only partially confirmed with the student simultaneous interpreters' group. Korpal's second hypothesis was that students and professionals have different degrees of awareness towards omission. With the responses received from both groups, the second hypothesis was not confirmed. As it showed, the students' responses conveyed that they were well aware that certain segments of the speech were too redundant, and had even wished they could have been able to omit more. Korpal concluded even though such responses did not substantiate their second hypothesis, it did show that students were aware about the strategic uses of omissions; what marked the difference between the novice

and the experienced lied in the fact that the novice omitted more informative segments than the experienced.

Such notion of simultaneous interpreters possibly using omissions as strategy also prompted Barghout, Rosendo, and García in 2015 to investigate, especially when interpreters are encountered with faster speech rate input. Barghout et al. (2015) hypothesized that when read speeches are delivered at high speech rate, expert interpreters omit redundant information as strategy. The study included 10 professional interpreters, with the language combination English (B) to French (A). The materials used in the experiment were three speeches selected from the Human Rights Council corpus. The criteria for the selection of the materials were lexical density, Barghout et al. (2015) cited Johansson (2008) that lexical density is the term most often used to describe the proportion of content words (nouns, verbs, adjectives, and adverbs) to the total number of words. The researchers of this study stated that they: "calculated by taking the total number of words with lexical properties divided by the total number of orthographic words for content words in relation to non-content words – is 0.5./0.5" (2015: p.319).

Besides the control of lexical density, the materials were recorded and manipulated into three different speeds, 120 wpm, 160 wpm, and 200 wpm. Barghout et al. (2015) stated that the cause for omission to be used are often involved with the occurrences of redundancies in the source speech. In order to examine such strategy use, two types of redundancies were included in the experiment design:

1. *redundant compound conjunctions* that does not add new information, or simply only repeated the already existing ideas, phrases such as "put differently" or " in other words";

2. *synonyms* that are alternative terms with meanings same or similar to a certain term in the same language, examples of pairs of synonyms are: "lack and absence" and "full and complete".

Results showed that in regards to synonyms, as speed rate increased, more synonyms were omitted. As for redundant compound conjunctions, however, there was an increase in the items interpreted in the fastest speed, 200 wpm (50%) when compared with the slightly slower speed 160 wpm (41%). This indicated that the interpreters omitted less when the speed increased. Barghout et al. mentioned that there could be three reasons to this situation:

1. The position of the redundant compound conjunctions in the sentence. Had the redundancies occurred in the middle of the sentence, it would have been difficult for the interpreters to avoid, especially at a higher speed rate level.

2. Interpreters would choose to tail the speaker even more closely once the speech rate increased.

3. It may be that once the speed rate reached 200 wpm, interpreters no longer have the capacity to discern what is important and what is redundant.

Barghout et al. (2015) concluded that for both types of items, the general result seemed to support the hypothesis that when the speed rate increased, the interpreters will omit redundant information deemed non-essential to the main message, which supports the aforementioned concept of "omission as an elaborate act" in order to preserve mental capacity.

Chiu (2017) attempted to examine if language proficiency would have an interactive effect with faster speed rate on simultaneous interpreter trainees. Chiu recruited 28 participants from T&I training institutes across Taiwan. In order to examine the effect of language proficiency, the participants were divided into two groups, based on their English proficiency level. Three speech materials were chosen and measured with the number of critical sentences contained in each speech. The researcher conducted a pilot study to determine the difficulty level of the speech materials, all 3 participants completed the two-year training program from NTNU

GITI, and served as initial judges for the speech material in determining the level of difficulty. The three speeches had three different speeds: 100 wpm, 130 wpm, and 160 wpm. Results showed that the level of English proficiency did not have an interactive effect with faster speed on the trainees. Regarding input rates by itself, though, did have a significant effect on the trainees. Chiu provided guest judge inter-rater reliability statistical results using Pearson correlation analysis and presented the process of discussing with the guest judge about the scoring criteria of the trainees' output. When it came to the three different speeds and its effect, it was found that participants at 100 wpm would experience an overload in memory capacity, leading to errors and omissions of words in particular; while at 160 wpm would lead to the saturation of cognitive capacity, thus leading to more and more omission of segments or units larger than words. In conclusion, Chiu (2017) mentioned that the results do suggest the trainees' SI performance are influenced by input speech rate, and that in order to cope with the differences of speech rate, students can focus on using strategies such as chunking and waiting, while speeding up other sub-processes such as word recognition and lexical retrieval. Chiu (2017) specifically focused on the language combination of English-Mandarin, of which the researcher mentioned that the syntactic interference resulting from such language combination played a major role in the trainees' performance even though the speech rate was at the slowest, which was 100 wpm. Chiu's study showed that the faster speech rates does have an effect on SI trainees, however, the speech rates cannot be too slow as to the point where the trainees begin to lose track of the previous utterances, which is the "memory trace decay". Additionally, Chiu mentioned that the topics of the speeches surrounded the theme of technology, which can be difficult to ascertain whether the trainees or the participants themselves have been exposed to similar topic of interest, nor the degrees of which they have been exposed to. Thus, the exposure

to the topic of the materials used and other variables may have influenced the outcomes where Chiu's experiment results showed that the level of English proficiency level did not have an interactive effect with the SI performance.

Concerning simultaneous interpreters need to constantly struggle with memory load and cope with the different speech rate coming from the speaker, Shlesinger (2003) found that the higher speech rate did not necessarily impact the simultaneous interpreters in their study. Shlesinger recruited 16 professional simultaneous interpreters to focus on nouns with a string of modifying adjectives. Due to the different syntactical structure of the language combination, which is Hebrew (A) into English (B), the researcher presumed this would bring in additional processing capacity for the SI interpreters on top of faster speech rate. The speech rates for the materials were 120 wpm and 140 wpm. Shlesinger found that participants consistently performed better when at faster speech rate 140 wpm than the slower speed rate 120 wpm. The researcher presumed this was due to the trained background and strategies deployed by the professional interpreters, Shlesinger concluded that simultaneous interpreting is a process of which working memory is of high priority and memory trace decay (forgetting what the speaker had said) is set to be avoided at all cost, hence this was probably the reason why interpreters performed better at a higher speech rate. Shlesinger's study were one of the few that presented results that showed the faster speech rates did not impact participants' SI performance. However, due to the particular language combination, Hebrew (A) to English (B), it may be more helpful if the experiment can also include the participants performing similar task from English (B) to Hebrew (A) in order to see if such strategy employed to catch up with the speaker as much as possible was possible in this direction. Since only one direction was presented, it may be the idiosyncratic nature of the Hebrew language that allowed the participants to "tail" the speaker as close as

possible, despite the faster speed rates. Without the results of the other direction, there is no other means of knowing.

Vančura (2013) looked into speech rate and its influence on SI trainees. The research tracked the progress of trainees through a three-month period of training. Participants have not practiced simultaneous interpretation before. The study collected a total of 12 hours length of speech output from the participants practicing SI from English (B) into Croatian (A). The materials were categorized first according to the speech content difficulty level: standard and intermediate. Next, the materials were further divided according to their speech rates. Within the *standard* level of content materials, the speech rates were divided as follow: 91-114 wpm (slow speed, 2 speeches); 130-158.80 wpm (standard speed, 13 speeches); 181.00 wpm (fast speed, 1 speech) (Vančura, 2013, p.92, Table 1). Within the *intermediate* level of content materials, the speech rates were divided as follow: 126.8-156 wpm (standard speed, 10 speeches); 161-211 wpm (fast speed, 12 speeches) (see Vančura, 2013, p,93, Table 2). Vančura (2013) found that the trainees performed better at the standard speech rates. Even the faster speed rates elicited better performance from participants than the speeches with the slower rates. Vančura concluded that the results fell in line with Shlesinger (2003), where the simultaneous interpreters in trying to avoid memory trace decay (forgetting things that the speaker said), will try at all cost to keep up with the speaker, therefore faster speech rate did not seem to present as a negative effect to the trainees. Therefore, as the trainees improved their skills and strategies in tailing the speaker as much as possible, the faster speech rate may not be as daunting as most students made it seem to be. While Vančura made contributions into the process of SI trainees with the language combination of Croatian and English, and also conformed with the results of Shlesinger's study, Vančura's study also did not investigate into the other direction of the SI task, as in from

Croatian (A) into English (B). Even though it is possible that the program only offered SI into B language at a later stage of training, and Vančura mentioned the background of the trainees to be naïve to the SI trainings, it would have made the study more comprehensive had the study provided results of the trainees performing tasks into both directions.

In more recent development, Rosendo and Galván (2019) studied the effect of faster speech rate by comparing novice interpreters with expert interpreters when simultaneous interpreting medical texts. The language combination was from English (B) to Spanish (A). The two dependent variables to be examined in the study were EVS length and target speech accuracy. The material used was selected by oncologists and surgeons who both spoke English and Spanish. The speech has a total length of 27 minutes 35 seconds, with the speed of 163.32 wpm. It was further divided by the researchers into three segments, and delivered at two different speech rates:

Part 1: moderate delivery speed (102 wpm);

Part 2: high delivery speed (162 wpm);

Part 3: moderate delivery speed (104 wpm)

Their goal was to minimize fatigue from the participants; hence they placed the high delivery speech rate segment in the middle of the speech. Rosendo and Galván (2019) found that the delivery rate did not have a statistically significant effect on the EVS variable. However, it was observed that novices had longer EVS when the speed increased. The experts though do have a shorter EVS but also had higher variability, meaning that the length of EVS for experts were of individual preference, the overall EVS length of the expert group did not show a trend towards shorter or longer EVS when the speed rates went faster. With the target speech accuracy variable, the researchers found that while the interaction between delivery rate and interpreter is

38

not statistically significant, but the main effect of delivery rate is significant, that the delivery rate did have an effect on target speech accuracy. The study put forward by Rosendo and Galván (2019) is significantly different from past research studies regarding speed and interpreting on two aspects: first of all, when judging the output of the participants, the researchers not only invited professional interpreters to assess the target speech accuracy, but also invited a panel of judges consisted of doctors and medical professionals, who were the main users of the interpretation service. This approach is not seen before in past studies, and it was adopted due to the fact that the speech material used involved specific medical terms that would require expert opinion. The second notable aspect has to do with the material being used in the study, the researcher specifically chosen medical-related text as material. Consider the results of this study, perhaps similar studies can be done on other specific fields that also require language service, such as economics, technology, political settings, news media etc.

Finally, Tai (2020) researched on the effect of faster speech rate on consecutive interpreting trainees, specifically with English (B) and Mandarin (A) language combination. The participants in the study were 20 students of T&I programs in Taiwan, they were divided into two groups: one group with only one year of training; the other with two years of training. The materials used in the study were two speeches of similar level of difficulty, with the slower speech rate at 134.5 wpm and faster speech rate at 164 wpm. After the experiment concluded, Tai (2020) analyzed the output of the participants along with their CI notes. Along with the output analysis, Tai also conducted interviews with the participants that were concerned with the strategies participants used when encountering faster speech rate. Tai found that the faster speech rate did have a negative impact on the participants' CI output.

There were five differences from the participants' notes in faster speed rate when compared with slower speed rate:

1. fewer symbols, more in language form

2. fewer notes in the form of the target language (Mandarin)

3. no clear preference of either full words or incomplete words

4. fewer notes in total

5. use fewer lines as segmentation

Tai concluded that the deciding factor for the better performance under faster speech rate was the ability to use segmentation well and that the length of training experience was not as indicative as being able to use strategies well.

Tai (2020)'s research is one that the present author can find that concerns with the effect of faster speech rate and CI trainees. From Tai (2020)'s results, it showed that there is indeed more room to explore to understand the process and strategy use for CI trainees.

With the above-mentioned research studies focusing on the impact of faster speech rate on interpretation, it can be seen that there are still room for improvements, such as more research effort into different modes of interpretation (Table 2), since most existing literatures focused on simultaneous interpretation, and different approaches or manipulation of the speech rates in question. Subsequent sections will also discuss other areas of improvements that can be made when exploring speech rate related research studies. Below in Table 2 show the results of the mentioned research studies.

Table 2.2 Overview of the SI speech rates related studies results.

Title	Mode	Participants	Language	Speed Calculation	Raters
Gerver (1969).	Simultaneous interpreting	10 professional interpreters	French (B) to English (A)	95 wpm; 112 wpm; 120 wpm; 142 wpm; 164 wpm	Not mentioned; presumably by the researcher or other professional interpreter
Pio (2003).	Simultaneous interpreting	10 student interpreters and 5 professional interpreters	German (B) or (C) to Italian (A)	196 syllables per minute (108 wpm); 302 syllables per minute (145 wpm)	The researcher
Meuleman & Van Besien (2009).	Simultaneous interpreting	16 professional interpreters	French (A) to Dutch (B)	184 wpm, 4.98 syllables per second (298.8	The researchers and two professional interpreters

				syllables per minute)	
Korpal (2012)	Simultaneous interpreting	11 student interpreters; 6 professional interpreters	English (B) to Polish (A)	130 wpm; 177 wpm; 180 wpm	The researcher
Barghout et al. (2015).	Simultaneous interpreting	10 professional interpreters	English (B) to French (A)	120 wpm; 160 wpm; 200 wpm	The researchers
Chiu (2017)	Simultaneous interpreting	28 student interpreters	English(B) to Mandarin(A)	100 wpm; 130 wpm; 160 wpm	The researcher and guest judge, provided with inter-rater reliability
Shlesinger (2003).	Simultaneous interpreting	16 professional interpreters	Hebrew (A) to English (B)	120 wpm; 140wpm	The researcher
Vančura (2013).	Simultaneous interpreting	19 student interpreters	English (B) to	Ranging from 91	The researcher

			Croatian (A)	wpm to 211 wpm	
Rosendo & Galván (2019).	Simultaneous interpreting	6 student interpreters; 11 professional interpreters	Spanish (A) to English (B)	102 wpm; 162 wpm; 104 wpm	The researcher and guest expert judges

Table 2.3 Overview of the CI speech rates related studies results

Ribas (2012).	Consecutive interpreting	8 novice student interpreters; 7 advanced student interpreters	English (C) to Spanish (A)	N/A	N/A
Tai (2020).	Consecutive interpreting	10 novice student interpreters; 10 advanced student interpreters	English (B) to Mandarin (A)	134.5 wpm; 164 wpm	The researcher and another interpreter.

As can be seen from Table 2.2 and Table 2.3, the studies listed concerning speech rate and SI or CI still have rooms for improvement. For instance, the majority of the past studies were focused on the SI mode, while there is still room to explore for the CI mode. Another issue with the experiment designs in the studies has to do with the assessor of the participants' performance. There were not many mentions of how the assessment criteria were selected or administered, and some of the research studies were assessed by only the researcher themselves. In order to gain more insight into speed rates and its effect, the assessment stage should be more consistent or at least revealed to follow up researchers. The above mentioned 11 research studies will be the focus of discussion for the following segments, in terms of assessing the participants performance and regarding omission as strategy use or not, as means of exploring room of improvements for speed-related research studies.

2.4 Assessing Student Interpreter's Performance

The topic of quality assessment for student interpreters' performance has been a long-time discussion in the field. Many authors have provided inputs from different angles and perspectives, ranging from user's expectations (Bühler, 1986; Kurz 1993; Ju, 1996), to final testing assessment for students of Translation and Interpretation programs (T&I programs) (Liu et al., 2008; Wu, 2013). Gile (1999c) mentioned that the variability of fidelity assessment may become too substantial if the raters were not given enough instructions or precise definitions. As Pöchhacker (2016) have mentioned, the key issues in final testing are the tasks involved and the criteria of which the performance of the student interpreters will be measured against. There have been plentiful literatures discussing the methods of performance targets and assessment

criteria, but there is little consensus on how to actually operationalize the ideas and concepts in order to achieve a more transparent assessment procedure (Pöchhacker, 2016, p.204).

Liu, Chuang, and Wu (2008) examined and provided an overview of the testing procedures of the 11 T&I programs, 4 of which are abroad while 7 of which are domestic in Taiwan. Liu et al. focused on three main aspects: testing process, testing materials, and assessment of performance. Liu et al. (2008) found that among the programs under review, all seemed to agreed that the criteria should include fidelity, delivery, and some programs would also include language skills. Fidelity is placed as top of the criteria for final testing performance.

Liu et al. (2008) also mentioned that most of the raters or judges for the accreditation tests were instructors of the course, or in some cases certain programs would follow the tradition of inviting guest judges to provide a more objective point of view, since they have never taught nor interacted closely with the student interpreters as well as the instructors may have been. However, it was noted in the study that none of the programs specified the training process for the judges and raters, nor did they mention any discussion of agreement on the definition of the criteria for testing (Liu et al., 2008, p.21, p.32).

Wu (2013) examined the process of group raters and their consistency of assessing the performance of student interpreters. Wu recruited three groups of raters: professional interpreters, professional interpreters who are also instructors at T&I programs, and translators. Through qualitative interview results, raters provided inputs on their assessment criteria: presentation and delivery, fidelity and completeness, audience point of view, interpreting skills and strategies, foundation abilities for interpreting. As can be seen, fidelity is once again listed as top of the criteria.

It was found that though the group rating results showed consistency when judging the student interpreters' performance, there was a wide variability when the raters provided their judgements as individuals. Wu (2013) concluded that the key aspect to this variability which led to many consider raters being too "subjective" when giving out results, wasn't that the raters disagreed on the criteria, but more so the raters did not clarify nor confer with each other on the definition and amplitude of the criteria.

In Liu and Chiu (2009), when assessing source material difficulty for CI, they also mentioned that it was agreed upon the raters that the fidelity of the interpretation output was considered as more of a clear-cut criterion for rating of accuracy (Liu& Chiu, 2009, p.251).

In summation, currently there are no clear-cut criteria concerning the assessment of student interpreters' final testing. Despite the situation, among all of the criteria mentioned, it can be seen that even though different programs have different procedures and practice or conduct, the one criterion "fidelity" seems to stand out as the golden rule for assessment. However, it was pointed out through past research studies that when a panel of raters or judges are involved, T&I programs did not provide training for guest judges or raters, let alone a clear discussion among the members in terms of the expectation of each criterion that was chosen.

Among the above mentioned speed related research studies, only Chiu (2017) mentioned their guest judging process and protocols as well as providing the Pearson correlation analysis for the inter-rater reliability. Other speed related research studies do not mention much in this regard, while it is understandable that the focus is on speed and its impact, but should future studies include the discussion among raters or judges, or even provided with inter-rater reliability statistical figures, perhaps it would allow the study results to become more comprehensive.

2.5 User's Expectation as Assessment for Professional Interpreters

The above section presented the current practices and criteria that T&I programs adopted in terms of assessing student interpreter's performance, which is what most of the research studies have been using. Wu (2013) mentioned that when assessing the student interpreter's performance, the raters often have to act as the role of the audience as well (Wu, 2013, p.23). But the fact of the matter is, there is a difference between professional interpreter's standards and the standards of the average audience. Hence the many studies done, as mentioned in the previous section, on the assessment protocols or the lack thereof in the existing T&I programs. The ultimate goal for any training program and the final testing is to prepare trainees to enter the market and become professional interpreters. Once novice interpreters enter the market, there are fewer ways to assess their output quality, among which is assessing the user's expectation.

As early as Bühler (1986) used a 16-part questionnaire and discussed some of the issues that involved with professional organizations such as AIIC and the special committee, The Committee on Admissions and Language Classification (CACL). CACL was set up within AIIC for the admission and language classification of the applicants to become one of the AIIC members, Bühler (1986) inquired the criteria used when screening or evaluating the performances of the interpreters. According to Bühler's findings, the order of concern with the assessment is as follows: "fluency of delivery (3), logical cohesion of utterance (4), sense consistency with the original message (5), completeness of Interpretation (6), correct grammatical usage (7), and use of correct terminology (8) were rated high by informants, and that among the extra-linguistic criteria reliability (14), followed by thorough preparation of Conference documents (10) and ability to work in a team (15), were the leaders. The criteria of native accent (1), pleasant voice (2), use of appropriate style (9), endurance (11), poise (12), and

pleasant appearance (13) were considered desirable in most cases, but not essential" (1986: p.233). Bühler's final criteria was concerned with user perception, for example, "how do the assessors perceive the positive feedback from delegates", which was the (16) criteria in the questionnaire, Bühler reported that "they do not for the most part consider it highly important and at least according to one comment think they should set up their own standards regardless of user reactions." (Bühler, 1986, p.231)

Bühler (1986) was mainly concerned with whether the assessment criteria at the time reflected the end users' reaction or perception at all. In Bühler's view and conclusion, the assessment criteria should be balanced between the requirements of the end user as well as fellow professional interpreter.

Kurz (1993) furthered the discussion based on the expectations from different user groups, and it was found through the method of questionnaire that the primary concerns that the users have were as of following sequence: sense consistency with original message; logical cohesion of utterance; use of correct terminology; fluency of delivery; correct grammar usage; pleasant voice; native accent. It was mentioned by Kurz that within the fluency of delivery criteria, experts of certain fields such medical doctors and engineers as users were more likely to adopt the "charity principle", meaning that they are more willing to overlook halting pauses or unnatural rhythms, as long as the interpretation still made sense to them. Interestingly, this finding of Kurz done in 1993 was corroborated by the speed related study done in 2019 by Rosendo and Galván, where in their research, which asked the medical professionals to serve as the judges for the interpreters' performances, it was reported that the expert judges also tend to be more lenient, that when comparing the results of level of accuracy and level of

comprehension, the latter was higher than the former, meaning that "even if the sentence was not entirely correct in Spanish, (the doctors) could understand it." (Kurz, 1993, p.19-20)

When applying the same question to a different cultural context, Ju (1996) has written an unpublished master's thesis on the user's perception of quality of interpreters' performance in Taiwan, and the research is dedicated to the language combination of English-Mandarin. Ju assessed the users from three types of audiences: business, engineering, and religious. Ju listed seven criteria on the questionnaire: native accent and pronunciation, fluency, coherency, pace, fidelity, correct terminology, and a pleasant-to-hear voice. Ju found that all three groups considered fidelity to be the most important criteria, followed by coherency and fluency. However, when compared with the findings of Kurz (1993), the different users also had different expectations; the business group emphasized on the correct terminology, the engineering group expected more on coherency; the religious group focused on the accent and pronunciation. Furthermore, in Kurz (1993), having a pleasant voice or native accent/pronunciation did not act as major issues in determining interpreters' performance. However, in Ju (1996), it was found that audience in the business group and the religious group, having a native accent/good pronunciation did play a major role in terms of assessing the quality of performance. Ju speculated that this could be due to the fact that audience held a pre-conceived notion that the speaker on stage was someone prominent in their field, their words carry weight. If the interpreter cannot even pronounce the words clearly or correctly, it seemed contradictory to the "pundit and expert" image that the audience had labelled on the speaker, and this would therefore lead to audiences feeling displeased about this aspect of the quality of service.

To briefly sum up the studies by Bühler (1986), Kurz (1993), and Ju (1996), it can be seen that when it comes to assessing the quality of interpreting output, linguistic features such as

fidelity and coherence of logic (consistency) are among the top criteria. But when looking closer from the user's perspective, especially in the Taiwanese audience group, there remained a gap between what the audience desired more of, and what the interpreters were short of providing, such as better accents, pronunciations, or even enunciations. With research studies assessing professional interpreters' performance, without expert judges or audience members present, it will run the risk of neglecting certain aspects of users' expectations, such as what Ju (1996) have mentioned in the study focusing on Taiwanese audience, that accents, pronunciations, and enunciations are of higher importance than what the interpreters had expected, which was contradicting to what Kurz (1993) has found. This also points out the importance of the cultural and linguistic background and their variability when interpreting studies are being conducted.

When looking at the research studies mentioned in the previous section, only Rosendo & Galván (2019) invited medical doctors and medical professionals (who were also the main target audience) to become members of their raters' panel, while the other studies were rated by the researcher themselves or with other professional interpreters, and did not provide their discussion of the assessment criteria involved.

2.6 The (non)consensus on ideal speed rate

The challenge presented by speed to interpreters has been well documented and discussed by past research studies. As early as 1968, special attention was given to the input rate and how it impacts simultaneous interpreting during the 1968 Alpbach meeting, those who attended had stated that input rate being too slow or too fast can be equally disruptive on processing, whilst discussing the topic of "Interpreters and Interpreting" (Alpbach 1968:2, cited from Pöchhacker, 2004).

When it comes to slower speed input, Shlesinger (2003) and Chiu (2017) have pointed out its detrimental effect in working memory for simultaneous interpreters, due to the memory trace decay issues. Chiu (2017) mentioned in their study, trainees going through tasks at a 100 wpm would often commit omissions because of losing track of what the speaker had said previously. Shlesinger (2003) found that for professional interpreters, even when performing SI between two languages with different sentence structures, the interpreters would strive for completion rather than omission by using strategies and skills. Results showed that since the professionals knew they had to play catch-up even closer with the speaker at the fastest speed rate, this actually resulted in professionals performing better in SI at a faster speed rate rather than a slower one.

On the other hand, when simultaneous interpreters are faced with faster speed, Barik (1973, 1975) found that omissions in interpreter's output is closely related to speech rates, the faster the speech rate, the greater the degree of omission.

Chang and Wu (2014) in their study on the non-native English speakers at conferences, approaching from the perspective of interpreters who were also non-native English speakers themselves, mentioned that the interpreters interviewed seem to agree that among the factors that would have impact on their performance, speed of delivery and content level difficulty can be more challenging than other factors, such as different accents from non-native English speakers.

In 2009, the Association Internationale des Interprètes de Conférence (AIIC) reported faster speech rate to be the largest source of stress (Neff, 2011). Similarly, in the 2012 statistical report also released by AIIC, "fast speed" ranked first among the main factors for interpreters in Switzerland in 2010 (cited from Barghout et al., 2015).

It is an area of vital interest for interpreters to find out what is the limitation of the speed rate they can handle, as well as what is the "ideal speed rate". Past research studies have also provided input into what is the ideal speed.

Early during the Nuremberg Trial in the 1980s, it was documented that 60 words per minute had been suggested for the speakers (Bowen & Bowen, 1985, p.75):

"The most striking feature is the concern for speed: an all-out effort was made to hold the speakers to almost dictation speed, approximately 60 words per minute."

This was done presumably to ensure that the interpretation output is of utmost accuracy. Other considerations were also put into place during the trial, such as fewer working hours for the interpreters, and that interpreters were only able to interpret into their own native language from one other language.

In Seleskovitch and Lederer (1989/1995), it was mentioned that the ideal original speed should be 100-120 wpm, but the author did not provide citations nor empirical evidence to support this statement (Seleskovitch & Lederer 1989/1995, p.8).

Later in Barghout et al. (2015), it was mentioned that researchers in the field seem to have an ideal range of speed in mind, but one researcher would deem it to be within a certain range, while others offer other options. It was suggested the ideal speed range should be between 100 and 130 wpm by several researchers as the ideal speed for SI. (Seleskovitch & Lederer 1984, cited from Barghout et al., 2015). Barghout et al. also further mentioned that according to AIIC, the ideal speed should be 3 minutes for a page of 40 lines in a text written to be read, which is around 130 wpm (Barghout et al., 2015, p.316). But there was never a real consensus on what the ideal speed rate should be.

Gerver (1976) brought up the ideal speed rate to be 120 words per minute, citing

Seleskovitch (1965), which is the most often cited source for ideal speed rate. Gerver explained

their research was based on Seleskovitch (1965)'s paper that an input rate between 100 and 120

words a minute is a comfortable one for simultaneous interpretation, and when the speed rates

climb up to between 150 and 200 words per minute, it is the upper limit for interpretation to

remain effective. While this figure of ideal speed rate of input may still differ from individual to

individual, notwithstanding taking into account the influence that may be brought on by different

language combinations, it seems that research studies discussing speed rates and its effect often

tend to agree on this figure to be the ideal speed rate for SI, or at least cite Gerver (1976) on the

ideal speed rate for simultaneous interpretation, i.e., "…the ideal speed rate is 120 wpm from

Gerver (1976), citing Seleskovitch (1965)". Gerver's 1976 statement came from their own 1969

study, where the participants have English as their A language and French as their B or C

language. The result showed that participants in the interpreter group performed worse than the

shadower group once the speed increased. Of all the speed rates included, ranging from 95 wpm

to 164 wpm, interpreters perform the best whilst in the 120 wpm speed rate. The result itself does

show promising implications and many research studies thereafter that are concerned with speed

would often cite this figure, despite the fact that the language combinations in their study may

not be the same as with Gerver's 1969 study, which was French and English. In Gile (1999b), it

was mentioned that this phenomenon has since created confusion and misrepresentation of the

actual information itself. Gile (1999b) explained that Seleskovitch (1965)'s statement on the

ideal speed rate came from an AIIC symposium held for interpreting instructors to share their

perspectives on best practices for teaching, meaning that the suggestion made by Seleskovitch in

1965, was under a prescriptive paradigm; the recommendation was not backed by any empirical evidence.

As can be read from the previous section of this study, during the Practitioner's period there were little empirical studies done by the practitioners themselves. Gile (1999b) continued to elaborate on the fact that the symposium in question was spoken in French, hence most following researchers who do not speak French can only cite Gerver's quote about Seleskovitch, let alone the fact that the paper from 1965 itself was difficult to even track down. In fact, Gile (1999b) mentioned that he was only able to find mentions of the 1965 symposium in a more recent publication by AIIC in 1979, which was also written in French. Another paper referencing the 1965 symposium by Class, Moser-Mercer, and Seeber (2004), mentioned that:

"In 1965 AIIC (Association Internationale des Interprètes de Conférence) organized its first colloquium on the teaching of interpreting (AIIC 1965) which brought together interpreter trainers from the leading schools at the time, Paris-ESIT, Geneva-ETI, Paris HEC, and Heidelberg. This was a time of stock-taking and more detailed descriptions of 'how to teach' simultaneous interpreting, but no structured approach had yet emerged for the training of interpreter trainers." (2004, p.3)

Thus Class et al. (2004) corroborated with what Gile (1999) had described about the 1965 symposium, and that the suggestion from Seleskovitch (1965) have been misrepresented as empirically-based research results and yet was still continuously being cited by many later on as "the ideal speed rate for SI is at 120 wpm". This reveals the fact that there is still much to discuss regarding the topic of speed, i.e., what exactly is the ideal speed? Perhaps Seleskovitch (1965), who as an iconic instructor in the field themselves, did have resourceful and anecdotal experience that 120 wpm seemed more ideal for their students, but different language

combinations were not put into consideration. Therefore, it is presumed that perhaps there are different types of ideal speed rates for different language combinations, as well as in different modes of interpretation, consecutive or simultaneous.

One thing remains consistent throughout the past research studies is that when the speed gets too fast, it does bring additional level of difficulty for interpreters, professionals and trainees alike. For trainees, it was presumed that the increased speed rate would affect their processing, marking it more in the form of "bottom-up", and more data-driven since the trainees do not have the time to process fuller, meaning-based units of text (Massaro& Shlesinger, 1997).

In Tai (2020), it was mentioned in their research into fast speech that for the average listener, 150 wpm is an acceptable speed. But for interpreters who have extra task at hand beyond simply passive listening, the speed rate will be of more influential to the interpreter than the average listener. For the average passive listeners, 150 wpm maybe an acceptable speed to follow, as they can afford to choose and select the parts of the speech they would want to focus on. For the interpreters though, it is an entirely different story, therefore, researchers in the past have already started looking into what exactly is the ideal speed for SI.

With such notion, Gerver's mention of ideal speed rate for SI being 120 wpm in 1976 is presumably not the definitive answer. Because that speed range did not undergo experimental testing yet until Gerver finished his initial research study in 1969, and found that faster speed did have impact on the interpreters. As for whether or not this is the ideal speed rate, there is so far no definitive answer too. Even if there is an ideal speed for interpreters to perform their task, which for SI cannot be too slow in order to avoid memory trace decay, and cannot be too fast for either CI or SI, interpreters cannot expect in real-life that speakers will always maintain the exact same pace of speed, let alone always maintain at the ideal speed rate that interpreters prefer.

2.7 Gradual Skill Acquisition

In the past prescriptive instructions toward teaching in class would suggest that trainees should sooner be ingratiated with the real-life speed rates as soon as possible, and that no concession should be made to adjust the speed according to the level of the trainees. In the previous section, it was mentioned that Weber (1984) believed that speed should not be conceded during the training period. Weber mentioned, "It is of the utmost importance in these initial phases not to make any concessions as to the speed in which the oral messages are presented." Weber believed that a slow delivery would only make it more enticing for the students to follow along the words, instead of the meaning, which is not the purpose of the training (Weber, 1984, p.39).

However, even with this in mind, Weber (1984) also mentioned that consecutive interpreting is a process of a specific skillset that needs to undergo practice to approach "automation", which was also evident in his model to explain the process of consecutive interpretation. But in order to achieve automation, there needs to be a gradual process of skill acquirement.

Also, in Seleskovitch and Lederer (1989/1995), the authors insisted that it is important that the instructors do not start off the class by slowing down the speed of the materials being used in class, stating the original pace should be 120 wpm-220wpm. This is suggested with the consideration that any speed slower than original would make it harder for the students to understand the meaning. In particular, sentences uttered too slowly would disconnect words from the original context and prompt the listener to focus on the words too much instead of the complete picture (Seleskovitch & Lederer, 1989/1995, p.39).

However, as time passed, in order to facilitate the process of learning interpretation, training programs have also looked into more diverse ways and methods to train future professionals. One of the most common training processes for trainees who seek to become professionals, begins from acquiring the skills of consecutive interpreting and then progresses into simultaneous interpreting. Ilgs and Lambert (1996) mentioned that one of the main points of learning CI is to develop the skills of communicating between two languages, while also citing the depth-of-processing hypothesis (Craik & Lockhart, 1972) being applied in Lambert's 1988 research to understand the processing capacity with different tasks involved. Result showed that the listening group and the CI group had higher results in recall and recognition scores, followed by simultaneous interpreting, and followed by the shadower group as last.

In addition, Gile (2001b) mentioned from a pedagogical perspective, there are four reasons to CI serving as a preparatory phase in training:

1. Separation of the listening phase and the reformulation phase. This leaves the interpreter more processing capacity in each phase by focusing on one thing at a time.

2. Given the time and space/booth (equipment) restraint in class, it is more practical for the instructors to start training with CI, so that the students can listen to the source speech at the same time, and listen to the designated student who is performing the CI at the same time; whereas, students would need to take turns in practicing SI due to time constraint and the amounts of booths available in class.

3. In CI, students can easily put their focus solely on listening to see what components of the source text they have missed out. Students training in CI would be able to do so by retracing their comprehension process by the use of their CI notes. While SI students may find it more challenging to recollect their comprehension process.

4. Finally, it is easier for the CI students to focus on the reformulation phase and provide a target text, because they are less distracted by the source language text structure.

Gile (2001b) concluded that due to the four reasons, it will be easier for the students find the weaker points of their language skills, and easier for instructors to diagnose the students' issues through the learning and training of CI.

Other authors have reflected on classifying the different stages the trainees would go through. Sawyer (2004) mentioned there are three levels of competency in interpreting, starting from "novice", which is the minimum level required to enter the training program, describing students who have no experience in consecutive or simultaneous interpreting. When after receiving a degree of immersion in the program training, the novice moves on to become an "advanced beginner", where the students obtain more advanced trainings and experiences of both CI and SI. When the students reach the final stage, which is "competent", this implies that the interpreter trainees are competent enough and are prepared to enter the professional market. (Sawyer, 2004, p.110) Such classification denotes the fact that students during different stages have specific needs and issues that they to improve, or skills they need to acquire gradually in order to move up to the next level.

When it comes to adjusting speed rates or material level difficulty accordingly for the trainees, Setton and Dawrant (2016) also provided guidelines on the gradual intake for the trainees when it comes to the learning and honing of the requisite skills, for example the Speech Difficulty Index (SDI) included in the guidebook (Setton& Dawrant, 2016, p.51). Setton and Dawrant mentioned the concept of "incremental realism", where the students spend most of their class time building the fundamental skills that are integral to the process of interpreting. It can start from something as simple as active listening, and gradually students are being introduced to

the real-life conditions for an expert interpreter to encounter. The potential hazards are added incrementally, speech level difficulty progresses from easy to more difficult, level of register stretches from relaxed to more formal, and delivery speed increases from slower to faster. Last of which is of most concern with the present study.

Other authors echo similar idea by discussing the possibility of breaking down the complicated tasks into sub-skills, Kurz (1992) mentioned that SI is a complex task and involves specific skillsets as well as fast information processing capacity, it is therefore presumably more ideal that during the training stage, students progress from easier tasks to difficult ones. Instructors can isolate problems to allow trainees to focus on one variable at a time. At a later stage, trainees can combine them into a more complex structure, that is the whole interpreting process itself.

In terms of empirical studies showing trainees at different stages of their training, Ribas (2012) study on novice group and advanced group also revealed the different issues trainees encounter. The novice group reported problems that have to do with poor sound quality, difficulty with numbers, speed of delivery, and their unfamiliarity with the topic. The advanced group also reported speed of delivery and lack of understanding as some of their top issues. Nonetheless, the results showed that the advanced group are more aware about the strategies they were using and more accustomed to the problem-solving process. Ribas (2012) also cited Gran (1998) that skills should be acquired gradually throughout time, and focus on one skill at a time. Gran (1998) believed that the key for automation lies in human information processing, where the human mind processes the knowledge through either procedural or declarative means. Children learn their mother tongue through procedural process; adults learn their second

language through means of declarative process, i.e., learning about the rules of the language, being tested on the grammar and syntax and so on.

What the training of interpreting is trying to attain in order for trainees to finally become more proficient in interpretation, is the question of how to transform the declarative knowledge which they are already equipped with into procedural language that has become automated and works naturally without thinking.

In order to achieve this goal, and by making the above comparison, Gran (1998) drew from theory related to implicit knowledge and explicit knowledge. Similar to declarative knowledge, explicit knowledge concerns with knowing the rules about the tasks that a person is doing; whereas in implicit knowledge, the person just simply complete the tasks, and in doing so, hone the skills that is needed to prefect the results. Gran (1998) believed this is the key to getting the trainees closer to "automation". The main point in relying on implicit knowledge, is the fact that with explicit knowledge, a person's attention can only focus on that particular item at one time, due to its inherent explicit nature and thus occupying the entirety of the individual's attention. Whereas inexplicit knowledge, or automated knowledge, acquisition can happen side by side without the tasks interfering with each other.

In order to do so, Gran (1998) mentioned that during the training stage it is crucial that the instructors identify the various components that would make up for the interpreting skills. Next, is to be able to allow trainees to perform one task at a time during interpretation, such as text analysis, abstracting, paraphrasing, sight translation, etc. Also, it is important to let the trainees practice the interpreting task as a whole, especially after they have a better understanding of the implicit competence of the interpreting process. Then, they should be allowed to focus on the more difficult parts of the interpreting process, such as accents, speed,

density of information, specialized terminology, and so on. Finally, instructors should also choose adequate materials to be used in class with specific purpose in mind.

To sum up, in order to train students from novice to competent, there are certain steps to take and considerations to keep in mind. It is assumed from the experienced instructors mentioned above, that the gradual process of skill training for students seems to be more ideal in ingratiating the trainees with the complex process of interpreting. Since speed is one of the main challenges that interpreters face on a regular basis, a gradual familiarization approach may be able to help trainees more in terms of developing strategies to handle speed rates that are either too fast or too slow.

2.8 Research Question

In order to examine the effects of slower speed rated on interpreter trainees, one must first ask the question of why there were no such relevant research studies in the past, why did no one look into the effect of slower speed and its impact on interpreter trainees? The researcher of this study, upon reviewing past related studies as well as methods available to past researchers of their time, have arrived to three possible options:

1. Past trainer's tendency to want to stay faithful to the real-life situations/conditions: Weber (1984) initially talked about being faithful and be as close to the real life situation as much as possible. Seleskovitch and Lederer (1989/1995) also believed that the slower speed rates would encourage students to stay too close to the words as a unit, instead of following the meanings of the entire context, and thus the purpose of the training will be lost.

2. Past research related to speed rates mostly dealt with simultaneous interpreting: when looking back to Gile's Effort Model again, specifically the output that takes place during the first Production Phase. In SI's production phase, in order to avoid memory trace decay, interpreters

have to produce output as soon as possible, whereas CI interpreters are writing their notes and waiting to go to their next phase. This is why SI interpreters would sometimes suffer from additional memory load if the speed is too slow. And this is also perhaps the reason why past research studies discussed about faster speed impacts, not all of them yielded significant result showing that slower speed rate would help the interpreters perform better, but would rather show that their participants were at risk of memory trace decay (Shlesinger, 2003; Vančura, 2013). This is because the interpreters were working in the simultaneous mode, where their main concern is not only just speed, but also memory trace decay as well. However, just as what previous section presented, just because SI interpreters have their output take place in the first phase, it does not necessarily mean that the speech rates do not affect CI interpreters (Ribas, 2012; Tai, 2020). In fact, the faster rates will affect the interpreter's processing and would result in many issues with their output during the second stage of the CI Effort Model.

In addition, there seems to be in ideal speed range for interpreters, perhaps it is something that is similar to the consecutive notes system, which can be highly individualistic, but there is also a range to the speed of the speech rate, it cannot be too fast and it cannot be too slow. What remains more consistent though, is that in the research, during the slower speed students were able to retain more of the input and process the info better as well as having enough time to put them down on notes. Meanwhile consistently, the faster speed posed as an obstacle for students to overcome.

3. Technology aids or the lack thereof: in the past there were not a lot of software applications that can easily manipulate the speed and visuals of the video materials, such as the software available today. The advancement of technology makes it easier for trainers and lecturers to more easily manipulate the speed rate of the materials, without losing the authenticity

of the original speech. For instance, the software used in this research was FinalCut Pro (Mac), while there is also other software such as Audacity (on Windows and Mac) that are provided either as freeware or would require a fee, but are all relatively easy to use. Thus, should the instructors want to set the speed at a specific rate for the trainees to practice on, it would simply take only a few minutes to operate and process through the audio files.

With the above discussion on past research studies done on speed and its impact on interpreter's performance, with most of the studies focusing on SI, while studies done on CI mode remain scarce, this study intends to explore how does slower speed affect interpreter trainees' performance.

It is a given understanding from literatures that when the speed becomes too fast, the interpreter's performance would suffer. The results showed that there will be more omissions, and longer EVS. Yet, when SI trainees are faced with too slow of a speed rate, such as 100 wpm, their performance would deteriorate as well (Chiu, 2017). On the other hand, Chang (2005) found that professional interpreters perform better at 100 wpm than at speed rate 130 wpm. In a different mode of interpretation, Tai (2020) mentioned that CI trainees' performance faltered when the speed rate climbed up. The three studies (Chang, 2005; Chiu, 2017; Tai, 2020) all had interpreters with the language combination of Mandarin as A language and English as B language. This study would like to examine if slowing down the speed of an original speech would hamper the trainees' performance, or would it improve the trainees' performance.

Furthermore, it has been documented that when novice trainees first encountered the balance between listening and analyzing, as well as taking CI notes, their overall processing capacity may become more easily saturated, according to Gile's Tightrope Hypothesis. This study also intends to explore if this can be found in the CI performances of the trainees.

Finally, since CI notes are key for trainees to perform well during the experiments, this study will also examine the effects of slower speed on their CI note-taking preferences. There are three research questions in this study:

Chapter Three   Research Method

This chapter is divided into six sections. The first section presents the overview of the study. The second section outlines the research design. The third section provides background information of the participants. The fourth section describes the selection method and design of input materials. The fifth section presents the process of the CI experiment. The last section discusses the methods of data scoring and analysis.

3.1 Overview of the study

The purpose of this research is to understand the impact of slower speech rates on interpreter trainees. Past research studies have shown that speed is one of the main stressors for professional interpreters and students alike. As early as Gerver in 1969 has discussed about the impact of fast speed on the interpreting process. One of the main outcomes when interpreters fall behind is the tendency to omit. This current research focuses on novice trainees, students who are college seniors who have no experience in interpreting training whatsoever. During the training phase, trainees are introduced to various factors that will have impact on their performance, speed being one of them. Trainees are asked to not just practice and hone the skills required to perform interpretation, but also recognize and develop their own personal set of strategies that will help them tackle the issues.

Past research studies have been done on the impact of faster speed rate, as in speed rate above 120 wpm, and the influence of the faster speech rate on professional interpreters as well as trainees. But none has been done on the effect of slower speech rate. This paper wishes to explore the impact of slower speech rate, and find out how do trainees perform. The research included 32 participants of collegiate level students who were taking introductory consecutive interpreting training course. The experiment design followed them over the course of the

semester, and was being administered on 3 separate occasions to see if any progress has been made.

Besides the focus on the slower rate of speed and its impact, another innovative approach of this study, lies within the process of how the experiment is carried out. Past studies controlled the speech rates at a certain range throughout the speech segments, i.e., in Chiu (2017), the speech rates were set at 100 wpm, 130 wpm, 160 wpm. This meant that the speech segments were carried out consistently at each speed rate every time the experiment was carried out. The participants would partake in the 100 wpm speech rate segment, where the speed rates were controlled consistently throughout. Next, the participant would move on to the 130 wpm segment, again with the speed rate controlled consistently throughout. Such method of control is done the same with the 160 wpm speed rate. The key is that the speed rates were all controlled in a laboratory setting. In real-life, more often the speaker would change their pace and speed rates throughout speeches, rarely does natural speech be carried out with only one speed rate. The majority of past speed-related research studies were carried out with the researcher first locate suitable speech materials and ask native speakers to re-record them while maintaining at a consistent speed; or the researcher would use audio manipulation software programs to ensure the speed rates were consistent throughout the same segment. (Gerver, 1969; Pio, 2003; Chang, 2005; Korpal, 2012, Barghout et al., 2015; Meuleman and Van Besien, 2009; Shlesinger, 2003; Rosendo & Galván, 2019; Tai, 2020). The present study is designed to follow the natural speed of the original speaker, with only modifications done on certain segments to be slowed down. Even the slowed down segments were embedded within the original speech materials, without letting the participants know if the speed rates have been altered.

This approach of embedded speed rate manipulation has never done before except for Rosendo and Galván (2019), so it will be interesting to see whether the participants will be able to recognize the change of speech rates. The answer to this particular question will be discussed through the answers given by the participants in the first post-test questionnaire and the final post-test questionnaire.

Besides the effect of speed change, this study wishes to see if the Tightrope Hypothesis also applies to student trainees, since they have no experience in interpreting training at all before participating in the experiment. Hence, this research would assume that there will be signs of fatigue or tiredness for the students over a period of time due to the focus and processing capacity required to complete the task. In line with the above mentioned, this research has two research questions:

Q1: Does the use of slower speech rate materials have an effect in interpreter trainees' output?

Q2: Do the different speech rates affect trainees' CI note-taking preferences? If so, what is the outcome?

Materials used were video recordings of speeches given by native speakers. There were 3 experiments in total, each experiment is made up of one selected clip of the video recording. The recording was edited into 4 parts, each part about 1 minute long. The researcher manipulated the speed of the second and fourth part, slowing down their speed into 75% of its original speech rate, without changing the cadence or tone. Thus, the end product looked like, original speed-slower speed-original speed-slower speed. The clips were played in class for the students, pausing after each speed segment in order to let students to record their own consecutive interpreting output. The researcher then collected the recordings from all three experiments and compared the result. First post-test questionnaire after the first experiment and the final post-test

questionnaire were also handed out to the participants in order to understand the student's background and their perspectives about speech rate in the experiment. Initial analysis results showed that the students tend to omit entire sentences during original speed; while in slower speed (75%), they were more able to retain more keywords. Post-test questionnaire showed that most students were not aware of the change of speed, presumably due to their focus were completely occupied on the task and had no other mental resource to reflect on the change. The result that they were able to retain more keywords during the slower segments. This could be a potential point of exploration for training purposes. Through the process of gradual skill acquirement, students will be allowed to focus on one thing at a time during the training process, and speed is one of the key components of the process. Once the students are more acquainted with the task, trainers can gradually introduce original speed or even faster speed to the students, guiding them to develop strategies to cope with potential issues in the process.

3.2 Research design

The research design of this study follows what Gile (2006) described as a more naturalistic and simple design. According to Gile (2006), after "The Practitioner's Period" led by Seleskovitch in the 1980s ended, the interpreting researchers sought other methodologies to implement in their research. One of which was called the "natural science paradigm", which was known as the "scientific method" or the "scientific approach". This paradigm can be furthered divided into two streams: one followed the more traditional experimental approach, with specific hypotheses, classical experiment designs, and used inferential statistics as tool. This stream was very precise, but it also encountered two major obstacles due to its stringent design (p. 20):

1. There were too many variables that exert influence to the interpreter's performance: such as the source language, the target language, the spontaneous, the semi-spontaneous, or prepared nature of the speech, etc.

2. There were too few participants to recruit for research: especially if the research is concerned with professional interpreters as participants, it might not be easy to recruit enough number of participants.

The researchers then turned to the second stream under the "natural science paradigm", which was compatible with the same fundamental principles but did not seek the same level of precision. It conducted research in a more naturalistic and simple design. Such type of research studies looked into topics such as authentic or quasi-authentic speeches at different delivery rate, with or without prior preparation, with or without particular accents, etc. This is the type of research method the current study adopted.

Gile (2006) stated that this approach was better suited for the present state of the conference interpreting research community. There are three advantages to this research design (p. 21):

1. It is a way of increasing volume of interpreting research, and can be carried out without much training and skills in sophisticated experimental design and much manipulation; it is within reach of motivated researcher and graduating students.

2. Ecological validity is better in such studies than in experimental setups involving control of every feature.

3. The lesser precision of the tool used is not necessarily a problem, due to high variability in interpreting.

This study follows what Gile (2006) mentioned above, the second stream of research design. This paper wishes to look at how slower speed impact CI trainee. One notable aspect of this study that is different from past research studies, is that the main goal is to reflect the natural state of in-class environment, instead of an artificial experiment setting. Therefore, the instructor provided the materials for the researcher to use on the day of the experiment. Though the selection was narrow, it was also meant to be part of the naturalistic research design, i.e., to be as realistic as possible, as in if they were the speeches that were going to be taught that day, and the researcher will only choose the experiment materials from that selection.

Another notable aspect of the current study that is different from past research study is, the slower speed segments are combined with the original speed segments. Whereas the past research studies re-recorded semi-authentic speeches with one speech rate per speech material. For example, Chiu (2017) provided separate speech materials for the different speed rates in their study. The participants would complete a speech material at speech rate 100 wpm, and then move on to a totally different speech material at a different speed rate. The majority of past studies that were concerned with speed mostly adopted this approach. Only Rosendo and Galván (2019) deviated from the past approach, where they combined the different speech rates together within the same speech. In this way, it will be perhaps be insightful to see if the faster or slower speed impacted the performances of the participants under the same speech material, instead of using different speech materials with different speed rates. It will be harder to decide whether it was the speed that impacted the interpreter's output, or was it due to the fact that participants had to get used to a different speech material that caused the variability in performance, which was the approach that the previous studies have adopted.

The current experiment design has a total of 12 different speed rates as independent variables and the participants' errors as dependent variables. A one-way ANOVA design was used to analyze the outcome of speech rates and its impact on the participants' performance.

A one-way ANOVA design was also applied to understand how do the different speech rates impact the participants' note-taking preferences. After the first experiment concluded, a first experiment post-test questionnaire was handed out inquiring the participants' view on the speech rates during the experiment, or if they have recognized the speech rates change at all.

After the third and final experiment concluded, a final experiment post-test questionnaire was handed out with the same questions inquiring the participants' view on the speech rates of the final experiment, or if they have recognized the speech rate changes at all.

3.3 Participants

Participants for the actual experiment were recruited from two groups of student interpreters who are all students that took the "Introductory Course in Interpretation" which lasted for a semester long, and was offered as a selective to senior year students exclusively.

The actual experiment participants were recruited from two different schools, the first group was from an university situated in the northern part of Taiwan,. The participants in this school were all senior students majoring in Foreign Languages Department with English as their major choice. There were 8 students who participated in the first experiment, 10 students in the second experiment, and 12 students in the third experiment.

The second group of participants were recruited from another university, located at the central part of Taiwan. The participants in this school were also senior year students who

majored in Foreign Language Department with English as main choice. There were 19 participants in the first experiment, as well as second and third experiment.

A pre-test questionnaire was administered in beginning of the experiment asking the participants' background information and English proficiency level. All the data were collected and later converted using the CEFR standard for ease of comparison. Results showed that although participants came from two different schools, their English proficiency level were between B1 (intermediate English), B2 (upper-intermediate English) to C1 (advanced English), according to the Common European Framework of References for Languages (CEFR), which is relatively close in terms of level of English proficiency. [2]Also, the participants were all brand new to learning consecutive interpreting. Table 3.1 shows the English proficiency of the participants in this study.

Table 3.1 English proficiency levels of the participants

CEFR Levels	N	%	Accumulated %
C1	11	40	40
B2	10	33.33	76
B1	10	33.33	100

---

[2] The participants may report GEPT level of "intermediate", or TOEIC score of 900, or TOEFL score of 100, these results are all equivalents of C1 in CEFR. This is based on the convertible reference table from: https://www.toeic.com.tw/quick-links/download/cefr/

3.4 Materials

The experiment materials were all taken from participants' in-class material. The materials chosen were all provided by the instructor of the class. The instructor provided the complete selection of speeches to be used on the day of the experiments, and the researcher chose clips from the speeches being used on the day of the class, that were more suitable for editing and experiment purposes.

The researcher examined the video clips make sure that the clips to be used should not contain specific names unfamiliar to the general public, location names, or other significantly technical terms that were unrelated to the topic at hand.

In Liu and Chiu (2009), it was mentioned that there were difficulties for instructors to choose suitable level of difficulty of materials to be used. The perception of difficulty regarding a particular topic or material is very subjective and can vary from person to person. The study chose various measures in deciding if there was a way to differentiate material difficulty, including readability level, information density, and new concept density based on propositional analysis. However, the results did not show any statistically significant result in showing that by adopting any measures will be able to decide the difficulty level of the materials.

Liu and Chiu (2009) have mentioned that many researchers adopted the Flesch ease of read formula to assess the source material difficulty, but the correlation result of that study showed that when the source material had a more difficult score from the readability formula, the better the interpreting performance (2009, p. 256). The information density assessed by propositional analysis produced highest correlation result, but it still did not reach significance.

In Chiu (2017), the study chose to ask the pilot study participants to be the judge and gauge the difficulty level of the actual experiment materials. There were three speech materials used in the study, all manipulated to different version of speed rates, 100 wpm, 130 wpm, and 160 wpm. The pilot study participants all agreed that no matter the topic, the faster speed rates were always the more difficult speech and speech A was the easiest in terms of content difficulty. But when speech text analysis was performed, according to the Flesch readability score speech B was the easiest one. However, the participants from the actual experiments had the highest syntactic interferences when performing CI task using speech B. As a result, Chiu (2017) also mentioned how it is extremely difficult to have proper control of the source materials when different speeches were adopted (2017, p. 143).

In light of the condition that in the current study that the researcher did not have full control over the speech materials, similar to the situation in that of Vančura (2013), the researcher followed basic guidelines in choosing clips for beginners that did not contain too many official names or titles, nor too many technical jargons. The speakers from all of the chosen speech materials were all native speakers, the first one spoke with a British accent, the second and third one spoke with North American accent.

Three clips from the above-mentioned speakers were selected to be used as materials for the three experiments spanning across the semester. Each clip is divided into 4 sections, each section is about 1 minute long. The second and the fourth section are manipulated with their speed being slowed down to 75% of its original speed, without losing the original tone and cadence. This has been done by the researcher by using the visual-audio editing software FinalCut Pro. Thus, the first and the third section of the clip would be original speed, while the second and fourth section would be slower speed. The sequence looked like this: original speed-

slower speed-original speed-slower speed. Table 3.2 shows the order of presentation speech rate in the pilot study.

Table 3.2 Presentation order of input speech rate for the pilot study

	Sequence	Label
original speed	First Segment	original_1
75% speed	Second Segment	slow_1
original speed	Third Segment	original_2
75% speed	Fourth Segment	slow_2

The clips were to be played in the participants' classes, the researcher gave instructions to the participants, in particular asking the students to have their recording devices at the ready. The researcher proceeded to play the clip, pausing after each section for the students to record their output. The outputs are later collected and compiled for analysis use.

According to the course design, when students are practicing interpretation skills following a consistent theme, it would further familiarize them with the vocabularies relevant to the topic and help eliminate language difficulties that might impede them from completing the consecutive interpreting task.

All of the materials taken and used for the experiment shared the same topic: "gender equality". The speaker for each experiment is as follows, according to the order of the experiment: Emma Watson's 2014 HeForShe campaign at the UN, Michelle Obama at the 2016 Democratic Convention, and Sheryl Sandberg's Ted Talk in 2010 on "Why We Have Too Few

Women Leaders." Each of the segment in the first experiment is shown in Table 3.3, Table 3.4, and Table 3.5, as follow:

Table 3.3 Presentation order of input rates for Experiment 1

	Speed Rates	Label	Length
original speed	142.5 wpm	E1original_1	40 seconds
75% speed	81.8 wpm	E1slow_1	55 seconds
original speed	121 wpm	E1original_2	60 seconds
75% speed	74.7 wpm	E1slow_2	73 seconds

Table 3.4 Presentation order of input rates for Experiment 2

	Speed Rates	Label	Length
original speed	149.5 wpm	E2original_1	67 seconds
75% speed	97.2 wpm	E2slow_1	66 seconds
original speed	160.3 wpm	E2original_2	55 seconds
75% speed	82.3 wpm	E2slow_2	78 seconds

Table 3.5 Presentation order of input rates for Experiment 3

	Speed Rates	Label	Length
original speed	200 wpm	E3original_1	51 seconds
75% speed	127 wpm	E3slow_1	75 seconds
original speed	181 wpm	E3original_2	52 seconds
75% speed	134 wpm	E3slow_2	71 seconds

3.4.1 Calculation for Speed Rate for Each Speech Segments

The calculation for the experiment material speed rate is as follows: A clip's length is close to 1 minute as much as much as possible, without too much information-loading, such as lists of examples, technical terms, numbers or dates etc. Each segment is then being transcribed for their transcripts, and then divided by their length of time in seconds. For example, the first segment lasted 51 seconds with 170 words. The speed rate is calculated by using 170 divided by 51, and then multiply by 60. The specific speed rate for that segment is 200 word per minute.

The same calculation method is used to obtain the speed rate for all the other segments. The method to achieve slower speed for the slower speed segments is by using the FinalCut Pro software on Mac system. By inputting a clip of the video and set the speed of rate at 75% of original speed, the output clip sounds slower without losing natural-sounding cadence and intonation.

The researcher did not control the input speed for the original segments to be equally set at a certain amount of speed rate, which is what most past research studies have opted to do, this study chose to use authentic speech speed, and adopted a more simplistic measure by using a software to slow speech rate down by 75%, the reason is with the hopes that by this relative easier execution to obtain the speech materials, and without having to control for speed, current result can be easily replicated and adopted to be used in classrooms for future training use or research purposes.

3.4.2 Pilot study

A pilot test was carried out in order to control the process and the execution of the actual experiment with a larger number of participants.

The pilot study was carried out with five participants who were senior students of Tam Kang University. They were all students studying under the department of English Literature, with Mandarin as their A language and English as their B language. None of the pilot test participants have ever taken CI training courses before. Steps were taken to ensure the participants have a general grasp of the CI note-taking and CI reproduction before the pilot test began.

The researcher first handed out the experiment consent form, ensuring the participants that their personal information will only be used for the experiment of the researcher. After the consent forms were signed and collected, the researcher also handed out a fill-out form to gain a basic understanding of their English proficiency level, and to understand whether they have heard or learned consecutive interpreting before participating in the current pilot study. Results showed that the participants have not taken courses on CI before, and their English proficiency level were between B1 (intermediate English, 2 participants), and B2 (upper-intermediate English, 3 participants) according to Common European Framework of Reference for Languages: Learning, Teaching, Assessment standard (CEFR). After the forms were collected, the researcher explained the general process of the CI task. Then a video was shown displaying how the CI notes were taken while the speaker was talking. The researcher mentioned that the idea of the CI notes can be consisted of symbols or abbreviations. The language can either be in SL (English, B language) or in TL (Mandarin, A language). The main purpose of showing the video was to highlight the importance of using space and segmentation on the page in order to facilitate the note-taking process and the recalling process. Finally, a video clip discussing about gender equality was played for the participants to warm up, get acquainted with the topic, and

start brainstorming about their CI notes or symbols to be used later on once the actual experiment started.

After the general introduction was completed, the researcher started testing the audio of the pilot test speech material. The speech material came from Emma Watson addressing the gender inequality issue at the World Economic Forum in Davos in 2015. The clip was chosen because it addressed the topic of gender inequality, which was the theme of the actual experiments, and the speaker was also one of the speakers from the actual experiments.

The speech material was manipulated in a similar way as with the actual experiment: the slower segments speed rates were 75% slower than the original speed. The reason why 75% was chosen was because that if the speed got any slower than 75%, the cadence and tone would start to sound unnatural. There were 4 segments in total, starting out with the original speed of the speaker, next the manipulated slower speed segment, and then back to the original speed of the speaker, and finally the manipulated slower speed segment.

When the participants were ready with their pen and paper, the researcher asked that the participants take out their smart phones to start recording the experiment process. The researcher reminded them that throughout the process the smart phone should be switched to airplane mode, and the recording application should always be on display. Once the recording button is pressed, it was to be left alone on the desk, and the participants were to focus on the speech and the CI notes.

After the participants were ready, the researcher played the first segment of the speech, which was set at original speed. Once the segment ended, the researcher paused and asked the participants to start reading their CI notes as well as provide their interpretation when speaking

into their own devices. When everyone finished their recording, the experiment resumed and proceeded to the next segment. Such process continued until all four segments were played and the participants finished recording their outputs.

Once the experiment concluded, the researcher asked the participants to save the recording file and send it to the researcher via email. The CI notes were also collected. The researcher handed out post-test questionnaire to fill out, inquiring questions such as, whether the change of speed rates was noticeable or not, if so, please state which segments were the slower speed segments. Other questions include if the participants felt that the slower speed rates helped them in taking down CI notes, or if the slower speed rates helped them recall better during the reproduction phase.

The results from the post-test questionnaire showed that 2 out of 5 participants recognized that segment 2 and segment 4 were altered to be slower speed. Overall, the pilot study participants agreed that slower speed rates did help them in comprehension of the speech, taking down CI notes, and better recalling.

Table 3.6 Presentation Order of Input Rates for Pilot Study

	Speed Rates	Label	Length
original speed	128 wpm	Pre_original_1	60 seconds
75% speed	93.8 wpm	Pre_slow_1	65 seconds
original speed	155 wpm	Pre_original_2	58 seconds
75% speed	100 wpm	Pre_slow_2	71 seconds

3.4.3 Pilot test error rate results

Table 3.7 The average error rate from pilot study

	Speech Rates	Label	Length	Error Rate
original speed	128 wpm	Pre_original_1	60 seconds	80%
75% speed	93.8 wpm	Pre_slow_1	65 seconds	23%
original speed	155 wpm	Pre_original_2	58 seconds	54%
75% speed	100 wpm	Pre_slow_2	71 seconds	34%

When comparing the first segment, which is original_1 to slow_1, there was a difference of 0.57, with the slow_1 having lesser errors. When comparing original_1 to slow_2, there was a difference of 0.36, with slow_2 having less errors. When comparing original_2 to slow_1, there was a difference of 0.31, with slow_1 having less errors. When comparing original_2 to slow_2, there was a difference of 0.2, with slow_2 having less errors.

According to the error rate results of the pilot study, it can be seen from Table 3.7 that participants seemed to have committed less errors during the slower speed segments, including slow_1 at 93.8 wpm, and slow_2 at 100 wpm.

3.4.4 Pilot Study ANOVA Results of Error Rates and Speed

According to Setton and Dawrant (2016), the SDI lists that speed at 100 wpm or under 100 wpm would be "artificial", speed 128 wpm would be "moderate", and speed rate 155 wpm would be "challenging". According to this index, the pilot study experiment speed input rate can be seen in Table 3.8.

Table 3.8 Presentation order of input rates for pilot study with SDI

	Input Rates	SDI	Error rate
original speed	128 wpm	moderate	80%
75% speed	93.8 wpm	artificial	23%
original speed	155 wpm	challenging	54%
75% speed	100 wpm	artificial	34%

Table 3.9 Means and Standard Deviations of input rates and error rates of pilot study

Speed Rate	*M*	*SD*	n
128 wpm	70.2	22.7	5
93.8 wpm	22.8	10.4	5
155 wpm	54.0	14.3	5
100 wpm	33.6	6.6	5

Pilot test ANOVA test result showed that there was a statistically significant difference between groups as determined by one-way ANOVA (F (3, 16) = 10.198, p = .001. A Tukey post hoc test revealed that segment 1, original speed 128 wpm (70.2 ± 22.76 errors, p= 0.01) had statistically significant higher errors than segment 2, slower speed at 93.8 wpm. The segment 1 speed also had statistically significant higher errors than segment 4, which was also at slower speed, 100 wpm (p= 0.006). Even though there were more errors in segment 1 original speed at 128 wpm than segment 3 original speed 155 wpm, there was no statistically significant difference. This means that the segment 1 has statistically significant difference when compared

82

with the segments 2 and 4, both of which belonged to the slower speed rates, 93.8 wpm, and 100 wpm.

Regarding the second segment, slower speed at 93.8 wpm (22.8 ± 10.4 errors, *p*= 0.001) had statistically significant less errors when compared with segment 1, 128 wpm. The second segment also had statistically significant less errors when compared with the fourth segment, original speed at 155 wpm (*p*= 0.02). Even though the second segment at 93.8 wpm had less errors than the fourth segment, also another slower speed segment, there was no statistically significant difference (*p*= 0.663).

When examining the results of segment 3, which was original speed at 155 wpm (54 ± 14.3 errors, *p*= 0.02), there was statistically significant more errors when compared with the second segment at 93. 8 wpm. Segment 3 had less errors than segment 1, but there was no statistical significance (*p*= 0.34). Segment 3 had more errors than segment 4 at 100 wpm, but there was also no statistically significant difference (*p*= 0.17).

When it came to segment 4 at 100 wpm, slower speed (33.6 ± 6.6 errors, *p*= 0.005), there was statistically significant less errors when compared with segment 1. Segment 4 had more slightly more errors than segment 2, also a slower speed segment, but there was no statistically significant difference (*p*= 0.66). Segment 4 had less errors than Segment 3, which was a original speed segment, but there was also no statistically significant difference (*p*= 0.17).

3.5 Procedure

This section will present the experiment procedure of the in-class process. There were three experiments in total, in order to follow the participants' progress throughout their course "Introductory to Interpretation", which lasted for a full semester. The first experiment started out

when the participants did not have much experience about CI; the second experiment took place during the point where the participants had obtained a general idea of what CI it; the third and final experiment transpired when the participants were more knowledgeable and were more familiar with the CI process. In other words, the three experiments followed the timeline of the course, in order to track the participants' response toward the slower speed in the experiment materials. The following section would also present the pre-test questionnaire, which included background information about the participant. The post-test questionnaire was distributed during the first experiment and the final experiment, and the main purpose of the post-text questionnaire was to inquire if the participants noticed the change of speed rates, if the slower rates helped with the note-taking process, and if the slower speed rates helped with the CI output production phase.

3.5.1 Experiment procedure

Participants of this study had all taken a course in introductory course of interpretation where it mainly focuses on the skills of training for consecutive interpretation, including text analysis and note-taking system etc. Throughout the course, "Introduction to Interpretation", the students were given opportunities to listen to speeches of consistent themes, in this case, it would cover feminism and gender equality. The purpose of using a consistent theme is to provide the students sufficient familiarity with the topic knowledge and the vocabularies needed in order to complete the interpretation.

In similar vein, the experiments were being integrated as part of the course that day, where the students would finish the section of their class for the day, and the researcher would then introduce themselves and give simple explanation about the experimental process. The changing of speed rates in the experiments were purposefully left out, so as to see whether the participants can even recognize the speed change or not.

The researcher first introduced themselves and gave explanation about the experiment, at this stage it was vital to obtain consent from those who do wish to participate. The researcher handed out consent forms stipulating that the recordings they are willing to provide for research will not be used in any other way beyond the scope of this research and that their personal information will be safely kept confidential.

Once consent forms were signed and collected, the researcher also handed out the pre-experiment questionnaire asking about their educational background, and English learning proficiency level. The researcher then moved on to the experiment phase.

The researcher explained that the experiment process is as follows: the students who agree to participate would prepare their recording device either using an app on their phone or through other means. The researcher also asked the participants to turn on airplane mode so as not to disturb the recording process. The participants were also asked to take out their pen and paper to prepare for consecutive note-taking. Once the experiment started, a scene would be displayed on the screen, asking the participants to press down the record button now, and not to touch the device until the speech was over. The researcher specified that once the recording button is set, please leave the device on the table, there is no need to pause or play during the experiment, and only stop once the entire experiment is fully complete. Once everybody is ready, and the recording button is set, the first segment with the original speed of the speaker begins. In doing so, the participants also begin their consecutive note-taking. On average each segment lasted around one minute, considering the level of information processing the trainees could handle at this stage. Once the segment ends, the experiment is paused and the researcher would ask all the participants to speak into their recording device using their consecutive notes at hand. Basically, asking the participants to complete the consecutive interpretation task based on the

one-minute segment of speech that they have just heard. Once everyone has finished recording their output, the researcher would then proceed to the second segment, which is the slower speed segment, without telling the participants that this is the slower speed. As with the previous segment, the participants were expected to listen and write down their notes, and once the segment was played through, the participants spoke into their recording device. The same procedure continued on and repeated for the third segment, which is the original speed; and so on for the final segment, which is again at slower speed.

After the experiment had fully concluded, the researcher asked the participants to stop the recording. The recordings were collected by the teacher assistant of the class and then handed to the researcher afterwards.

A post-experiment questionnaire was also handed out for the participants to fill out, with the main purpose of inquiring the students whether the speech video clips were too difficult to understand, and more importantly, whether the students noticed any speed changes throughout the experiment. If they did notice a change of speed, which segment of the experiment had changed.

After collecting the recordings, consent forms, pre- and post- experiment questionnaires, this concludes the process of the first experiment.

The CI notes collected from the participants were from Experiment 2 and Experiment 3. The notes from Experiment 1 were not collected due to the fact that the participants were not mentally-prepared or familiar enough with the note-taking process yet. Several of the participants also did not bring pen and paper to class, as some of the students were still auditing

the course. The final student enrollment list was settled when the due date for Experiment 2 arrived.

Following similar procedures of the first experiment, the researcher returned to administer the second experiment, and collected the recordings and notes. Again, after a period of time, the researcher returned to execute the third and final experiment, as well as collecting the recordings and notes once the experiment was completed.

The same procedure was done on the second group, which is with the students at The National Chung Hsing University, located in the central part of Taiwan.

After the experiments were completed, the researcher offered each participant a one-on-one session to discuss their performance and to answer their questions about learning interpretation or English in general. The interviews were optional for the participants to attend and was offered as compensation for their participation. The researcher also provided additional materials such as handouts for the participants to take home after the sessions were completed.

3.5.2 Pre-test questionnaire

The pre-test questionnaire was anonymously filled out and was handed out after the first experiment concluded. The items on the questionnaire mainly concerned with the participants' experiences in learning English, and their proficiency level. The researcher listed several different types of testing, such as TOEIC, TOFEL, GEPT, or any other types of testing. Some participants have taken the TOEIC, but not the TOFEL while others may have taken the GEPT but not the TOFEL. Some participants have taken neither of the testing types listed, and instead put down their IELTS score for reference. In order to achieve an equal base to measure the participant's English proficiency level, the researcher used the Council of Europe's Common

European Framework of Reference for Languages (CEFR as abbreviation, http://www.coe.int/t/dg4/linguistic/cadre1_en.asp "COE website") as the baseline, and converted the different testing results into CEFR results. Such as previously mentioned in the participants section, the converted results showed that participants were between B1(intermediate English), B2(upper-intermediate English) to C1(advanced English).

3.5.3 Post-test questionnaire

The post-test questionnaire was distributed twice to the participants and to be filled out anonymously. The first time was after Experiment 1 ended. The second time was after Experiment 3 ended. The purpose of the post-test questionnaire is to inquire the participants regarding two aspects of the experiments:

1. Did the participants notice the change of speech rates?

2. Did the slower speech rates helped with the note-taking, or with the recall and reproduction stage?

The actual post-test questionnaire items contained 5 questions, all open-ended questions for the participants to fill out:

1. There were four segments in the experiment, did you notice that some of the segments had a slower speech rate? If you did, can you answer which of the segments were slower speech rate?

2. What do you think about the effects of slower speech rate?

3. Does slower speech rate help you understand the speaker better? Or did it impede your comprehension?

4. Did slower speech rate affect your taking down CI notes? Did you help you recall better? Or, did it help you take down CI notes, but had no effect in helping you recall?

5. Did slower speech rate affect your output phase? Did it help you have a smoother output? Or did it impede your output phase?

The first question of the questionnaire was the "indicative" question to see if the participants noticed the change of speed rates at all. According to Gile's CI Effort Model, the interpreter would be so consumed with the task that the interpreter is presumed to be always close to capacity saturation. Combined with the factor that under Gile's Tightrope Hypothesis, novice in the beginning of practicing CI note-taking will have a particularly difficult time balancing the different Efforts.

The post-test questionnaire was distributed twice to elicit answers from the participants in order to better understand their opinions or attitude toward slower speed segments in consecutive interpreting. The first distribution was after the first experiment ended, and the second time was when the third experiment concluded. Since there was quite some time between the first post-test questionnaire and the second post-test questionnaire was distributed, there could be a change of perspective from the participants' regarding speed rates and its impact on their CI output.

3.6 Data scoring and analysis

The data scoring and analysis section present participants' performance under different speech rates. There are two types of error analysis in this study: the first one considers the overall error rate of the participants' output across different speech rates. The method used is by calculating the errors of the participants through all of the experiments. The second type of error analysis concerns the type of errors the participants' commit under different speech rates. A one-

way ANOVA design was adopted in order to better understand the impact of speech rates and the error types of the participants. This study also invited a professional interpreter who is also an experienced instructor to review the output of the participants. An inter-rater reliability analysis was adopted in order to ensure agreement across the two rater's assessment.

Continuing on with the analysis, the CI notes taken during the experiments were also examined. The note unit categorization will also be presented in this section.

Following the CI notes categorization, the study will also present a brief overview of the pre-test questionnaire as well as the post-test questionnaire calculation. In short, this section will present the calculation of error rate analysis, the error categories, guest rater rating process and inter-rater reliability using Pearson's correlation, and the categorization of CI note units.

3.6.1 Error rate by segments calculation

In past research studies, the focus of speed-related studies was on the faster speech rates and its impact on SI interpreters. The error rates in present study are being used as a base for comparison across all experiments, in order to ascertain the error rates between the original speech rate segments and the slower speech rate segments.

This study provided error rate calculations to give an overview of participants' performance across all experiments. Each of the experiment is divided into 4 different segments with different speech rates. When it comes to the assessing process, each of the segments is consisted of different sentences that are being used as units to assess the accuracy of the participant's output. For example, the first segment of experiment one was divided into 11 sentences or units, and all of the participants' outputs were measured using these units as basis in order to get a consistent assessment standard. If the first participant got 7 units incorrect, out of 11 units in total, then

their accuracy rate would be 0.64, with 64% presented in percentage. This was calculated across all of the participants based on the number of units in that segment and how many incorrect unit participants have made.

3.6.2 Error categories

The error rates calculation previously presented an overview of the participants' performance. But this study also wishes to explore if there is any specific type of error participants would commit when encountering different speed rates. Gerver (1969) mentioned that when the speed rates went up, the interpreters tended to commit more Therefore, the researcher adopted error categories to analyze the type of errors that participants committed.

The error categories followed the error categories presented in Barik (1971), they are as follows: the omission of words, omission of segments, substitution of words, and substitution of segments.

When assessing the participants' outputs, there can only be one type of error assigned to the incorrect output. For example, if the participants committed one omission and one substitution, then it was assigned as "substitution of segment" only. No double-punishment was applied for the incorrect output from the participants.

Omission of word.

Participants who have omitted a single noun or verb that is pertinent to be considered as delivering the original message faithfully will be marked as omission of word.

Examples of omission of word from unit 5 and unit 13 of Experiment 2:

Unit 5 source text: our champion, our hero. /5 (the underlined word was the word omitted in the trainees' output.)

Participant 4: 他是我們的英雄，痾，

Participant 21: 他對我來說是英雄，

Unit 13 source text: to get himself across the room /13 (the underlined word was the word omitted in the trainees' output.)

Participant 9: 才能走去

Participant 29: 走，走到

Omission of segment.

Participants who have omitted more than one word that is pertinent to be considered as delivering the original message faithfully will be marked as omission of segments.

Examples of omission of segment from unit 5 and unit 7 of Experiment 1:

Unit 5 source text: and to do that we need everyone to be involved. /5 (the underlined words are the words omitted in the trainees' output.)

Participant 2: 希望大家能夠一起努力。

Participant 6: 這個活動需要每一個人的參與。

Unit 7 source text: we want to try and galvanize as many men and boys as possible/7 (the underlined words are the words omitted in the trainees' output.)

Participant 2: 我們需要，我們需要男性來

Participant 12: 尤其是男性

The difference between omission of word and omission of segment is that the former is concerned with single word omission. When more than one word was omitted, the unit will be marked as omission of segments.

Substitution of word.

Participants who have replaced or misinterpreted one word that is crucial to render the output faithful to the original message will be marked as substitution of word.

Examples of substitution of word taken from unit 13 and unit 23 of Experiment 3:

Unit 13 source text: that women are dropping out. /13 (the underlined word/phrase is the word that was substituted in the trainees' output.)

Participant 7: 女性的比例持續在下降。(The ration of the number of women is declining.)

Participant 13: 女人總是常常被隔，隔絕於外。(Women are always blocked on the outside.)

Unit 23 source text: I want to be very clear that this speech comes with no judgments. /23 (the underlined word/phrase is the word that was substituted in the trainees' output.)

Participant 11: 痾，我今天的這個演講，我不希望有任何的，痾，我不希望受到任何的批判，(I don't wish to receive any criticism today with my speech.)

Substitution of segment.

Participants who have replaced of misinterpreted more than one word that is crucial to render the output faithful to the original message will be marked as substitution of segment.

Examples of substitution of segment taken from unit 33 and unit 39 of Experiment 2:

Unit 33 source text: Those folks weren't asking for a handout or a shortcut. /33 (the underlined words are the words that were substituted in the trainees' output.)

Participant 9: 解決這樣的困境並沒有任何的捷徑，(There are no shortcuts in solving this predicament.)

Participant 23: 想要獲得資源可以來供養他們的家庭，(Just with to receive resources to provide for their family.)

Unit 39 source text: and he spoke words that have stayed with me ever since. /39 (the underlined words are the words that were substituted in the trainees' output.)

Participant 1: 這也是歐巴馬他一直以來在灌輸我的一個信念。(This is the belief that Obama has been trying to impart to me ever since.)

Participant 27: 歐巴馬他一直站在我身邊為，為我說話。(Obama has always stood by me, and spoke up on my behalf.)

The difference between substitution of word and substitution of segment lies in how many words have been replaced or misinterpreted; if there is only one word being substituted in the unit, it will be marked as substitution of word, if there is more than one word, it will be marked as substitution of segment.

3.6.3 Guest rater

When concerning the performances of the student interpreters, the researcher invited an experienced professional interpreter of the field to act as guest judge. The guest judge also had years of experiences instructing graduate level student in interpretation.

The researcher and the guest rater discussed length the criteria that is to be used in the study. In particular, will the two individuals hold consistent view on each one of the criteria, i.e., what constitutes as an omission of word? Does missing one word qualify as omission of word? Does this apply to all of the words in the unit, regardless of the parts of speech, i.e., noun, verb, adverb, and adjective?

The researcher sent the guest rater 3 types of files for each participant: recording of the experiment, transcript of the output, and the CI notes. During the first round of rating, the researcher asked the guest rater to perform rating on Participant 1's first experiment output, reading the transcript with the audio recording playing at the same time. After the rating was finished, the researcher would discuss some of the details regarding certain words or segments in the speech materials, as well as the participants' output. The researcher specifically asked the guest rater to keep in mind that the participants of the study were brand new to interpretation. In such a scenario, it was agreed upon the researcher and the guest rater certain adjustments should be made when rating the trainees during this stage of the training, instead of judging them against the professional standard.

The process of discussion between the researcher and the guest rater would also help inform the researcher to adjust the rating for the error ratings mentioned in the previous section.

There was a total of 32 participants in this study, the guest rater evaluated the first 5 participants from the first university group, and 5 participants from the second university group, which is 10 participants in total. A Pearson correlation analysis was conducted in order to determine the inter-rater reliability (Harvey, 2021; de Raadt et al., 2021).

3.6.4 Inter-rater reliability

The inter-rater reliability was calculated through a Pearson correlation analysis on the scoring of the 5 random participants from Tam Kang University and the other 5 random participants from National Chung Hsing University. Pearson correlation analysis was performed in SPSS 26 for Mac in order the to measure the degree of agreement between the two raters on four error categories: omission of words (OW), omission of segments (OS), substitution of words (SW), and substitution of segments (SS). Table 3.10 presents the descriptive statistics of scores from the two raters. Table 3.11 presents the results of correlation analysis. The correlation coefficient ranges from .58 to .96, all reaching .01 significant level.

Table 3.10 Means and Standard Deviations for each error category

	OW			OS			SW			SS		
	M	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*
Researcher	.25	.538	120	5.61	4.26	120	.73	1.09	120	2.60	1.93	120
Guest rater	.17	.455	120	5.47	4.23	120	.65	1.12	108	3.74	2.52	108

Table 3.11 Correlation coefficient of two raters on four error categories

	OW	OS	SW	SS
correlation	.58**	.96**	.59**	.73**

*Note. ** p<.01*

3.6.5 Categorization of CI note units

In order to understand how the speed rated affect trainees' performance when completing CI task, the CI notes of the participants from the experiments were collected and categorized. There were three experimental events in total, but only two sets of CI notes were collected. This was due to the fact that during the first experiment, not all the participants were prepared to complete CI with notes. Therefore, only notes from the second experiment and the third experiment were collected.

The categorization of the note units was adapted from the categorization of Dam (2004a) and Dam (2004b), which was also used in Chen (2017) as well as Tai (2020). The current research will also be examining the trainees' notes based on past researchers' categorization. The categorization of the notes units is as follows:

1. language: source language (English, B language) or target language (Mandarin, A language)

2. full words or abbreviation

3. symbols or language

4. segmentation

5. numbers

Chapter Four Results

This chapter covers the results from analyzing slower speed rates and its impact on interpreter trainees using one-way ANOVA. The descriptive statistics will be presented first in each section, followed by one-way ANOVA results. The first part of the analysis consists of the error calculation of the error rate from experiments. The second part of the analysis includes Pearson correlation coefficient result of the errors and the speed rates. The third part of this chapter presents the one-way ANOVA results of speed rates and its effect on participants' errors, as well as the error types. The fourth part of the chapter consists of the result of the pre-test questionnaire, which focused on participant's background and English proficiency. The fifth part of the chapter includes the post-test questionnaire results, which inquired the participants' perception on speaker's speech rate and its impact on their own CI process.

Table 4.1 Analysis presented in this chapter

Analysis	Comparison
1. Error rate of participants	Compare error rate and speech rates
2. One-way ANOVA of speech rates and error	Compare error rate and speech rates using One-way ANOVA
3. One-way ANOVA of experiment and error	Compare error rate and experiments using One-way ANOVA
4. One-way ANOVA of speech rates and error category (omission of word, omission of segment, substitution of word, and substitution of error)	Compare error categories and speech rates using One-way ANOVA

5. One-way ANOVA of speech rates and   Compare CI notes category and speech rates

   CI notes category (SL vs. TL,   using One-way ANOVA

   language vs. symbol, full vs.

   abbreviation, numbers, segmentation)

4.1 Error rate of participants

This section of the analysis used the calculation method mentioned in Chapter 3, error rate by segments calculation. The analysis is first presented through the sequence of the experiments. Finally, the error rates analysis results were put altogether to be compared and presented. Figure 4.1 shows the comparison between the error rate and speech rates from all three experiments.

Figure 4.1 Comparison between error rate and speech rates

Error rate of each participant during all three experiments

Compared with

Speech rates from all three experiments

Experiment 3 had the most salient result when it comes to speech rates affecting trainees' output. The slower rates elicited better performances.

Table 4.2 Speech rates from all three experiments

Experiment 1	Speed Rates
original_1	142.5 wpm
slow_1	81.8 wpm
original_2	121 wpm
slow_2	74.7 wpm
Experiment 2	Speed Rates
original_1	149.5 wpm
slow_1	97.2 wpm
original_2	160.3 wpm
slow_2	82.3 wpm
Experiment 3	Speed Rates
original_1	200 wpm
slow_1	127 wpm
original_2	181 wpm
slow_2	134 wpm

4.1.1 Error rate calculation result of Experiment 1

This section presents the average error rate calculation results for all participants from Experiment 1. The sequence of the experiment is as follows: original_1 (142.5 wpm), slow_1 (81.8 wpm), original_2 (121.0 wpm), and slow_2 (74.7 wpm). The calculation method used was described above in the previous section. Table 4.3 and Figure 4.2 show that when the speed was slowed down for the first time, the average error rate decreased from 50% to 31%. However,

what is interesting to note is that when the speed went from 81.8 wpm (slow_1) to 121.0 wpm (original_2), it did not negatively impact the participant's performance; the original_2 (121.0 wpm) average segment error rate has actually gone down from 31% to 27%. Moreover, when reaching the final segment (slow_2, 74.7 wpm) where the speed was slowed down again, the participants committed more errors than the previous segment (original_2, 121.0 wpm), ending experiment 1 with average error rate at 39%. One speculation for this phenomenon is that the participants experienced fatigue as beginners learning CI. As mentioned in the literature review section, Gile (1999) stated that novice interpreters would encounter the tightrope experience in the beginning, due to the fact that in order to balance between CI note-taking and listening and analyzing would take more time and practice. Table 4.3 and Figure 4.2 show the average error rate of Experiment 1.

Table 4.3 Average error rate from Experiment 1

Experiment segment	Speed rate	Average error rate
E1 original_1	142.5 wpm	50%
E1 slow_1	81.8 wpm	31%
E1 original_2	121 wpm	27%
E1 slow_2	74.6 wpm	39%

Figure 4.2 Average error rate from Experiment 1

Experiment 1 average error rate

—●— Experiment 1 average error rate

4.1.2 Error rate calculation result of Experiment 2

This section presents the error rate calculation average results for all participants from Experiment 2. The sequence of the experiment is as follows: original_1 (149.5 wpm), slow_1 (97.2 wpm), original_2 (160.3 wpm), and slow_2 (82.3 wpm). Table 4.2 and Figure 4.2 show that when speed was slowed down the first time, the average error rate did not decrease. Once the speed went back to original, meaning when slow_1 (97.2 wpm) was compared against original_2 (160.3 wpm), the average error rate increased from 81% to 87%. What is noteworthy to point out is that when transitioning from original_2 (160.3 wpm) to slow_2 (82.3 wpm), the average error rate neither increased or decreased but remained the same at 87%. Unlike the first experiment, the participants did not seem to experience fatigue as much as they did during the slow_2 segment in the first experiment. Table 4.4 and Figure 4.3 show the error rate average of Experiment 2.

Table 4.4 Average error rate from Experiment 2

Experiment segment	Speed rate	Average error rate
E2 original_1	149.5 wpm	72%
E2 slow_1	97.2 wpm	81%
E2 original_2	160.3 wpm	87%
E2 slow_2	82.3 wpm	87%

Figure 4.3 Average error rate from Experiment 2

4.1.3 Error rate calculation result of Experiment 3

This section presents the average error rate calculation average results for all participants from Experiment 2. The sequence of the experiment is as follows: original_1 (200.0 wpm), slow_1 (127.0 wpm), original_2 (181.0 wpm), and slow_2 (134.0 wpm). Table 4.5 and Figure 4.4 show that participants at this stage of training seemed to be able to have a better grasp of their note-taking skills, as well as taking advantage of the slower speed segments (slow_1, 127

wpm; slow_2, 134 wpm) by committing less errors during the slower speed segments comparing to the original speed segments. The fatigue effect at the very end of the experiment also did not show up in Experiment 3.

Table 4.5 Average error rate from Experiment 3

Experiment segment	Speed rate	Average error rate
E3 original_1	200 wpm	77%
E3 slow_1	127 wpm	53%
E3 original_2	181 wpm	78%
E3 slow_2	134 wpm	63%

Figure 4.4 Average error rate from Experiment 3

Experiment 3 average error rate

4.1.4 Error rate average calculation for all experiments

By collecting all the error rates from all the participants from all three experiments, this section provides the overall picture of how the participants performed in each speed segment:

original_1, slow_1, original_2, and slow_2. This is to see how the slower speed rates and the speed change affected the participants' performance. Table 4.6 and Figure 4.5 show that overall, when the speed rate was slowed down for the first time, the average error rates decreased from 61% to 50%. When the speed rate climbed back to original, the average error rates increased from 50% to 59%. Once the speed rate slowed down again, the average error rates seemed to increase during Experiment 1 and Experiment 2, presumably due to the Tightrope Hypothesis described in Gile (1999), where novice will tend to experience cognitive capacity saturation when attempting to balance between listening and analyzing and taking CI notes. However, such phenomenon did not occur during Experiment 3, where all of the speed rates were relatively faster than the prior two experiments. This could be due to trainee's practice and gradual knowledge of the task leading up to performing better in the final experiment. Furthermore, when being combined altogether, by just comparing all the original speed segments average error rate (60%) and all of the slower speed segments average error rate (56%), there is slight decrease of error rate from the slower speed segments. Table 4.6 and Figure 4.5 shows the average error rate for all experiments. When looking at the ALL original_1, which is the average for errors from the first original speech rate segment, it can be seen from that the trainees error rate was at 61%, when the speech rate decreased to ALL slow_1, which is the average error rate for the first slower speech rate segment, the average error rate dropped to 50%. When returning back to ALL original_2, which is the average error rate for the second original speech rate segment, the average *climbed up* to 59%. Hence the ALL slow_1 segment seemed to have a positive effect in trainees' output. However, when progressing to the ALL slow_2 segment, which is the second slower speech rate segment, the average error rate did not decrease, but rather increased from ALL original_2's 59% to ALL slow_2's 61%. Previously mentioned in the separate experiment

analysis section above, this could be due to the trainees experiencing fatigue or unfamiliarity during Experiment 1 and Experiment 2 to have caused this outcome. If only looking at the Experiment 3 results as mentioned above, it can be seen that the trainees average error rate during the second slower speech segment decreased instead.

Table 4.6 Average error rate for all experiments

Experiment segment	Average error rate
ALL original_1	61%
ALL slow_1	50%
ALL original_2	59%
ALL slow_2	61%

Table 4.7 Average error rate of all original speech rate segments vs. slower speech rate segments

All original speech rate segment average error rate	60%
All slower speech rate segment average error rate	56%

Figure 4.5 Average error rate for all experiments

ALL experiments average error rate

4.2 Correlation coefficient result

A Pearson correlation coefficient was calculated to assess the relationship between the speed rates and the errors rates. The independent variable in this case will be the *speech rates*, while the dependent variable will be the *error rate*, as in errors committed by the trainees. There was a positive correlation between the two variables, r (346) =.418, p=.00. The relationship was positive and significant, but only at a moderate level. Table 4.8 shows the M and SD, and Table 4.9 shows the results of the correlation coefficient.

Table 4.8 Means & SD of the correlation coefficient between speed rates and the error rate

	M	SD
Error rate	57.59	22.577
Speed rates	65.00	3.4566

Table 4.9 Pearson's correlation coefficient result between error rate and speed rates

	Speed rate
Error rate	.418**

*Note. ** p<.01*

This result showed that a direct analysis of the correlation coefficient relationship between speech rates and errors are positive, however, the effect of the speech rates on the errors in this study is only moderate. When looking at the *slow_2* segments in Experiment 1 and 2, it can be seen that the trainees did not necessarily perform better during the slower speech rate segments. This could be due to the fact that trainees were still familiarizing themselves with the CI process, building their own note-taking system, etc., hence the slow_2 segments did not display a positive effect in the first two experiments. With this consideration in mind, it could be

a contributing factor as to the reason why the Pearson correlation coefficient result has only reached a moderate level.

4.3 ANOVA results

This section attempts to explore the relationship between speed rates and errors, experiments and errors, speed rates and error types, and experiments and error types by using one-way ANOVA. There were twelve speed rates in the experiments, hence the speed rates and errors analysis wish to understand which speed rate has the least error means. The study also wishes to examine which type of errors would occur with different speed rates, hence the speed rates and error types analysis. There were three different materials used in class and for the experiment, hence the experiments and errors analysis were to find out which one was easier or which one was more difficult. Even though the researcher had no control over the choice of the materials, the different materials may also affect the error types that the trainees commit, hence the experiment and error type analysis. There are twelve different speed rates from three different experiments, as can be seen in Table 2.5., Setton and Dawrant (2016) provided Speech Difficulty Index (SDI) to assist trainers in setting the parameters for testing trainees at different stages of training. According to the SDI, the twelve speed rates in this current study can be separated into 5 different groups: <100 wpm, 120-140 wpm, 140 wpm-160 wpm, 160-180 wpm, >180 wpm, as shown in Table 4.10. The one-way ANOVA will use the nominal groups of speed rates to compare with the errors.

Table 4.10 Speech rate groups according to the SDI

Speed rates	SDI	Experiment segments
<100 wpm	"Artificial"	E1 slow_1 (81.8 wpm),
		E1 slow_2 (74.7 wpm),
		E2 slow_1 (97.2 wpm),
		E2 slow_2 (82.3 wpm).
100-120 wpm	"Easy"	N/A
120-140 wpm	"Moderate"	E1 original_2 (121 wpm),
		E3 slow_1 (127 wpm),
		E3 slow_2 (134 wpm).
140-160 wpm	"Challenging"	E1 original_1 (142.5 wpm),
		E2 original_1 (149.5 wpm),
160-180 wpm	"Difficult"- "Impossible"	E2 original_2 (160.3 wpm)
>180 wpm	"Impossible"	E3 original_2 (181 wpm)
		E3 original_1 (200 wpm)

4.3.1 One-way ANOVA of speech rates and errors

Figure 4.6 Variables within one-way ANOVA of speech rates and errors

The average mean of errors across different experiments

Compared with

Speech rates from all three experiments

Out of all the 12 different speech rates across the three experiments, the 120-140 wpm range group performed the best, while performance started to deteriorate once the speech rate increased to 160-180 wpm and even more apparent once it climbed to >180 wpm

Table 4.11 shows the effect of speed rates on errors, there was a statistically significant difference between groups as determined by one-way ANOVA (F (4, 343) = 22.047, p=.00. Table 4.10 shows the M and the SD of speed rates and errors.

A Tukey post hoc test revealed that the <100 wpm (M=53.68, SD=24.88) group has statistically significant lower error rate when compared with 160-180 wpm (M=67.24, SD=17.29), p =.01. The <100 wpm group also has statistically significant lower error rate when compared with the >180 wpm speed group (M=77.13, SD=10.16), p=.00. The <100 wpm group

has more error rate than the 120-140 wpm group and the 140-160 wpm group, but the results did not reach statistical significance.

The 120-140 wpm group (*M*=48.97, *SD* =20.85) has statistically significant lower error rate when compared with the 160-180 wpm group (*M*=67.24, *SD*=17.29)*, p*=.00, and the >180 wpm group (*M*=77.13, *SD*=10.16), *p*=.00. The 120-140 wpm group has less error rate than the <100 wpm group and the 140-160 wpm group, but there was no statistical significance.

The 140-160 wpm group (*M*=52.46, *SD*=18.58) has statistically significant lower error rate than the speed group 160-180 wpm (*M*=67.24, *SD*=17.29), *p*=.01 and the >180 wpm (*M*=77.13, *SD*=10.16), *p*=.00. The 140-160 wpm group has less error rate than the <100 wpm group but the result was not statistically significant. The 140-160 wpm group has higher error rate than the 120-140 wpm group, but there was also no statistical significance.

The 160-180 wpm group (*M*=67.24, *SD*=17.29) has statistically significant higher error rate than the <100 wpm group (*M*=53.68, *SD*=24.88), *p*=.01, the 120-140 wpm group (*M*=48.97, *SD*=20.85), *p*=.00, and the 140-160 wpm group (*M*= 52.46, *SD*= 18.58), *p* =.01. The 160-180 wpm group has less error rate than the >180 wpm group, but there was no statistical significance.

The >180 wpm (*M*=77.13, *SD*=10.16) group has statistically significant higher error rate than the <100 wpm group (*M*=53.68, *SD*=24.88), *p*=.00, the 120-140 wpm group (*M*=48.97, *SD*=20.85), *p*=.00, and the 140-160 wpm group (*M*=52.46, *SD*=18.58), *p*=.00. The >180 wpm group has more error rate than the 160-180 wpm group, but there was no statistical significance. Figure 4.7 shows the means of the speed rate groups.

From Figure 4.7, it can be seen that the 120-140 wpm group was the best performing group of all, followed by the 140-160 wpm group, the <100 wpm group, the 160-180 group, and finally, the >180 wpm group.

It was presumed that perhaps the trainees would perform better at the slower speech rate groups, however, the slowest speech rate group of this current study, the <100 wpm group, did not necessarily yielded the best result. The <100 wpm group included segments that were all manipulated at 75% speed. The best performing group, the 120-140 wpm group included one original speech rate segment (E1 original_2, 121 wpm) and the other two segments were the 75% speed version from Experiment 3. When looking at the 140-160 wpm group, the 160-180 wpm group, and the >180 wpm group, these groups included all of the original speech rate groups from the three experiments.

When comparing the results of the overall average error rate across the three experiments, it is shown that slower speech rate groups, the 120-140 wpm group and the <100 group, seemed to have less error rate from the trainees. According to the SDI chart that categorized the three experiments of the current study (Table 4.10, see p.109), it seems that Experiment 3 slower speech rate segments (E3 slow_1, 127 wpm, E3 slow_2, 134 wpm), Experiment 1 original_2 segment (121 wpm), Experiment 1 slower speech rate segments (E1 slow_1, 81.8 wpm, E1 slow_2, 74.7 wpm), and Experiment 2 slower speech rate segments (E2 slow_1, 97.2 wpm, E2 slow_2, 82.3 wpm) have the lowest error rate from trainees. Only one original speech segment (E1 original_2, 121 wpm) were included among the speech rate group. This result may be indicative to show that slower speech rates does have an effect on the performance of CI trainees, and the effect of which would be committing less errors.

Table 4.11 One-way ANOVA result of speed results and error

ANOVA

error

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	67434.035	2	33717.018	106.288	.000**
Within Groups	109442.379	345	317.224		
Total	176876.414	347			

*Note. * p < .05; ** p < .01*

Table 4.12 Means & SD of One-way ANOVA between speed rates and error

Descriptives

error

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min.	Max.
					Lower Bound	Upper Bound		
<100 wpm	112	53.68	24.885	2.351	49.02	58.34	0	100
120-140 wpm	89	48.97	20.855	2.211	44.57	53.36	6	89

140-160 wpm	56	52.46	18.588	2.484	47.49	57.44	8	96
160-180 wpm	29	67.24	17.299	3.212	60.66	73.82	10	100
>180 wpm	62	77.13	10.167	1.291	74.55	79.71	57	100
Total	348	57.59	22.577	1.210	55.21	59.97	0	100

Figure 4.7 Mean of error in One-way ANOVA result of speed rates and error

4.3.2 One-way ANOVA of experiments and errors

Figure 4.8 Variables in one-way ANOVA of experiments and errors

Table 4.13 shows the effect of experiments on errors. there was a statistically significant difference between groups as determined by one-way ANOVA (F (2, 345) = 106.288, p=.00). Table 4.14 shows the M and the SD of the results, Figure 4.9 shows the error means plot.

A Tuckey post hoc test revealed that there was a statistically significant difference between errors produced across the experiments. Experiment 1 (M=36.8, SD=19.66) has statistically significant lower error rate when compared with Experiment 2 (M=66, SD=17.86), p=.00. Experiment 1 (M=36.8, SD=19.6) also has statistically significant lower error rate when compared with Experiment 3 (M=67.7, SD=15.9), p=.00. Experiment 2 has lower error rate than

Experiment 3, but there was no statistical significance, *p*=.74. This shows that Experiment 3 has the highest error rate and came last in terms of participants' performance.

The purpose of this analysis is to examine the effect of three experiments on the error rate. The three experiments took place during different occasions of the training course, with trainees gradually getting more used to the CI working process. This analysis wishes to look at the progress or the changes the trainees may have possessed after a period of training. Results showed that the Experiment 1 has the least errors, then follows Experiment 2, and finally Experiment 3 according to Figure 4.9. It was presumed that trainees would have had more experience during Experiment 3 than they had during Experiment 1, and that they would perform better with less errors during Experiment 3. However, that was not the case here. Conversely, Experiment 1 actually fielded less error rate. If the current result were examined along with the SDI table (Table 4.10), it can be seen again that the slowest speech rates tend to fall in

Experiment 1, perhaps this is the reason why that the Experiment 1 has less error than the other experiments.

Table 4.13 One-way ANOVA of experiments and error rate
ANOVA

error

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	67434.035	2	33717.018	106.288	.000
Within Groups	109442.379	345	317.224		

Total	176876.414	347

Table 4.14 M and SD of One-way ANOVA of experiments and error

Descriptives

error

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Experiment 1	108	36.86	19.663	1.892	33.11	40.61	0	91
Experiment 2	116	66.04	17.863	1.659	62.76	69.33	8	100
Experiment 3	124	67.73	15.972	1.434	64.89	70.56	19	100
Total	348	57.59	22.577	1.210	55.21	59.97	0	100

Figure 4.9 Mean of error in One-way ANOVA of experiments and error rate

4.3.3 One-way ANOVA of speech rates and error types

This section aims to present the effect of speed rates on the types of errors the participants would commit throughout all of the experiments. The categories of errors are: omission of word, omission of segment, substitution of word, and substitution of segment.

Figure 4.10 Variables within one-way ANOVA of speech rates and error types

Error types of all trainees across all experiments; error types: omission of word, omission of segment, substitution of word, substitution of segment

Compared with

Speech rates across all three experiments

Omission of segment is the most obvious category of all that is negatively affected by faster speech rates. The fastest speech rate, the >180 wpm group, has the most errors of omission of segment (OS) and substitution of segment (SS).

4.3.3.1 Speed rates and omission of word

Table 4.15 shows the result of the effect of speed rates on the omission of word (OW) error from participants. Table 4.16 shows the M and SD for omission of error of all participants. Figure 4.11 shows the mean of omission of word across different speed rates. A one-way ANOVA result revealed there was statistically significant difference between groups, $(F_{(4, 343)} = 89.015, p=.00)$.

119

The <100 wpm group has less OW errors than other groups such as the 120-140 wpm, 140-160 wpm, and the 160-180 wpm group, but the results did not reach significant. The <100 group has more omission of word errors than >180 wpm group, but the results were not statistically significant either.

The 120-140 wpm group ((*M*=.59, *SD*=.77) has statistically significant more OW errors than the >180 wpm group (*M*=.26, *SD*=.51), *p*=.01. The 120-140 wpm group has more OW errors than the <100 wpm group, but the result was not statistically significant. The 120-140 wpm group has less OS errors than the 140-160 wpm and the 160-180 wpm group, but the result was also not statistically significant.

The 140-160 wpm group (*M*=.63, *SD*=.72) has statistically significant more omission of word errors than the >180 wpm group (*M*=.26, *SD*=.51), *p*=.03. The 140-160 wpm group has more OW errors than the <100 wpm group and the 120-140 wpm group, but there was no statistically significant result. The 140-160 wpm group has less OW errors than the 160-180 wpm group, but there was also no statistically significant result.

The 160-180 wpm group (*M*=.79, *SD*=.91) has statistically significant more omission of word than the >180 wpm group (*M*=.26, *SD*=.51), *p*=.00. The 160-180 wpm group has more OW errors than the <100 wpm group, the 120-140 wpm group, and the 140-160 wpm group, but there was no statistically significant result.

The >180 wpm group (*M*=.26, *SD*=.51) has statistically lower OW errors than the 120-140 wpm group (*M*=.59, *SD*=.77), *p*= .03, the 140-160 wpm group (*M*=.63, *SD*=.72), *p*=.03, and the 160-180 wpm group (*M*=.79, *SD*=.91), *p*=.00. The >180 wpm group has less OW error than the <100 wpm group, but there was no statistically significant result.

When looking at Figure 4.11, it can be seen that the OW error mean was highest in the 160-180 wpm group, then follows the 140-160 wpm group, the 120-140 wpm group, the <100 wpm group, and the >180 wpm group. The analysis is focused on the error categories that are most often seen across different speech rate groups; hence, the current result does not mean that while the >180 wpm group committed less OW errors, that the group also committed less errors overall. It can be seen later on that the >180 wpm group committed other errors more than the other speech rate groups, such as the omission of segment (OS) errors.

The OW error was highest during the 160-180 wpm group, the criteria for rating OW errors were missing one critical word/idea from the unit. Since the 160-180 wpm group has the highest OW errors than the rest of the groups (with the >180 wpm group committing more OS errors as can be seen later on), it may be possible that the 160-180 wpm group was too fast of a speech rate for the trainees to catch all the keywords. According to the SDI table (Table 4.10), only Experiment 3 original_2 (181 wpm) is in the 160-180 wpm range.

Table 4.15 One-way ANOVA result of speed rates and omission of word
ANOVA

OW

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.382	4	2.096	4.420	.002*
Within Groups	162.606	343	.474		
Total	170.989	347			

*Note. * p < .05; ** p < .01*

Table 4.16 M and SD of One-way ANOVA result of speed rates and omission of word

Descriptives

OW

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Min.	Max.
<100 wpm	112	.41	.609	.058	.30	.52	0	2
120-140 wpm	90	.59	.777	.082	.43	.75	0	3
140-160 wpm	56	.63	.728	.097	.43	.82	0	2
160-180 wpm	28	.79	.917	.173	.43	1.14	0	3
>180 wpm	62	.26	.510	.065	.13	.39	0	2
Total	348	.49	.702	.038	.42	.57	0	3

Figure 4.11 Mean of omission of word across different speed groups

4.3.3.2 Speed rates and omission of segment

Figure 4.15 shows the result of the effect of speed rates on the omission of segment error from participants. Table 4.16 shows the *M* and *SD* for omission of segment (OS) for all participants. A one-way ANOVA result revealed there was statistically significant difference between the speed rate groups, (F (4, 343) = 89.015, p=.00).

A Tukey post hoc test was performed to determine the difference between the groups. The <100 wpm group (*M*=3.27, *SD*=2.46) has statistically significant less omission of segment errors than the 140-160 wpm group (*M*=5.91, *SD*=4.31), *p*=.00, the 160-180 wpm group (*M*=8.96, *SD*=3.43), *p*=.00, and the >180 wpm group (*M*=11.73, *SD*=2.85), *p*=.00. The <100 wpm group has less OS errors than the 120-140 wpm group, but there was no statistically significant result.

The 120-140 wpm group (*M*=4.16, *SD*=2.94) has statistically significant less errors than the 140-160 wpm group (*M*=5.91, *SD*=4.31), *p*=.00, the 160-180 wpm group, *p*=.00, and the >180 wpm speed group (*M*=11.73, *SD*=2.85), *p*=.00. The 120-140 wpm group has more OS errors than the <100 wpm group, but there was no statistically significant result.

The 140-160 wpm group (*M*=5.91, *SD*=4.31) has more OS errors than the <100 wpm group (*M*=3.27, *SD*=2.46), *p*=.00, and the 120-140 wpm group (*M*=4.16, *SD*=2.94), *p*=.00. The 140-160 wpm group (*M*=5.91, *SD*=4.31) has statistically significant less errors than the 160-180 wpm group (*M*=8.96, *SD*=3.43), *p*=.00 and the >180 wpm group, *p*=.00.

The 160-180 wpm group (*M*= 8.96, *SD*= 3.43) has more OS errors than the <100 wpm group (*M*=3.27, *SD*=2.46), *p*=.00, the 120-140 wpm group (*M*=4.16, *SD*=2.94), *p*=.00, and the 140-160 wpm group (*M*=5.91, *SD*=4.31), *p*=.00. The 160-180 wpm group (*M*=8.96, *SD*=3.43) has statistically significant less OS errors with the >180 wpm group (*M*=11.73, *SD*=2.85), *p*=.00.

The >180 wpm speed (*M*=11.73, *SD*=2.85) group has more statistically significantly more OS errors than the <100 wpm group (*M*=3.27, *SD*=2.46), *p*=.00, the 120-140 wpm group (*M*=4.16, *SD*=2.94), *p*=.00, the 140-160 wpm group (*M*=5.91, *SD*=4.31), *p*=.00, and the 160-180 wpm group (*M*=11.73, *SD*=2.85), *p*=.00. The >180 wpm group was the only group that has statistically significant more OS errors than all the other groups.

Table 4.17 One-way ANOVA result of speed rates and omission of segment

ANOVA

Omission of segment

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3416.986	4	854.247	89.015	.000**
Within Groups	3291.643	343	9.597		
Total	6708.629	347			

*Note. * p < .05; ** p < .01*

Table 4.2 M and SD of One-way ANOVA result of speed rates and omission of segment

Descriptives

Omission of segment

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
<100 wpm	112	3.27	2.468	.233	2.81	3.73	0	10
120-140 wpm	90	4.16	2.949	.311	3.54	4.77	0	11
140-160 wpm	56	5.91	4.316	.577	4.75	7.07	0	21

160-180 wpm	28	8.96	3.437	.650	7.63	10.30	0	19
>180 wpm	62	11.73	2.858	.363	11.00	12.45	7	23
Total	348	5.89	4.397	.236	5.42	6.35	0	23

Figure 4.12 Mean of omission of segment across different speed groups

4.3.3.3 Speed rates and substitution of word

Figure 4.13 shows the result of the effect of speed rates on the substitution of word (SW) error from participants. Table 4.19 show the *M* and *SD* for substitution of word for all participants. A one-way ANOVA result revealed there was statistically significant difference between groups, (F (4, 343) = 3.204, p=.01).

A Tukey post hoc test was performed to determine the difference between the speed groups. There was no statistically significant difference between the speed groups. The <100 wpm group has less SW errors than the 120-140 wpm group, the 160-180 wpm group, and

the >180 wpm group, but there was no statistical significance. The <100 wpm has more SW errors than the 140-160 wpm group, but there was also no statistical significance.

The 120-140 wpm group has more SW errors than the <100 wpm group, the 140-160 wpm group, and the >180 wpm group, but there was no statistical significance. The 120-140 wpm group has less SW errors than the 160-180 wpm group, but there was also no statistically significant result.

The 140-160 wpm group has the least SW errors than the other groups. The 140-160 wpm group has less SW errors than the <100 wpm group, the 120-140 wpm group, the 160-180 wpm group, and the >180 wpm group, but there was no statistical significance.

The 160-180 wpm group has more SW errors than the rest of the groups, but there was no statistical significance. The 160-180 wpm group has more SW errors than the <100 wpm group, the 120-140 wpm group, the 140-160 wpm group, and the >180 wpm group.

The >180 wpm group has more SW errors than the <100 wpm group and the 140-160 wpm group, but there was no statistical significance. The >180 wpm group has less SW errors than the 120-140 wpm group and the 160-180 wpm group, but there was also no statistical significance.

Table 4.3 One-way ANOVA result of speed rates and substitution of word

ANOVA

Substitution of word

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	15.910	4	3.978	3.204	.013*
Within Groups	425.837	343	1.242		
Total	441.747	347			

*Note. * p < .05; ** p < .01*

Table 4.20 M and SD of One-way ANOVA result of speed rates and substitution of word
Descriptives

Substitution of word

			Std.		95% Confidence Interval for Mean			
	N	Mean	Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
<100 wpm	112	.93	.856	.081	.77	1.09	0	4
120-140 wpm	90	1.33	1.469	.155	1.03	1.64	0	6
140-160 wpm	56	.91	.920	.123	.66	1.16	0	3

160-180 wpm	28	1.50	1.319	.249	.99	2.01	0	4
>180 wpm	62	.95	.982	.125	.70	1.20	0	4
Total		348	1.08	1.128	.060	.96	1.20	0	6

Figure 4.13 Mean of substitution of word across different speed groups

4.3.3.4 Speed rates and substitution of segment

Figure 4.14 shows the result of the effect of speed rates on the substitution of segment (ss) error from participants. Table 4.22 shows the *M* and *SD* for substitution of segment for all participants. A one-way ANOVA calculated the results and it revealed that there was a statistically significant difference between the groups, $(F (4, 343) = 15.365, p=.00)$.

A Tukey post hoc test was performed to determine the difference between the groups. The <100 wpm group (*M*=2.11, *SD*=1.65) has statistically significant less SS errors than the 120-140 wpm group (*M*=3.07, *SD*=2.15), *p*=.00, as well as the >180 wpm group (*M*=4.06, *SD*=2.03), *p*=.00. The <100 wpm group has more SS errors than the 140-160 wpm group, but there was no statistical significance. The <100 wpm group has less SS errors than the 160-180 wpm group, but there was also no statistical significance.

The 120-140 wpm group (*M*=3.07, *SD*=2.15) has statistically significant more SS errors than the <100 wpm group (*M*=2.11, *SD*=1.65), *p*=.00 and the 140-160 wpm group (*M*=1.79, *SD*=1.54), *p*=.00. The 120-140 wpm group (*M*=3.07, *SD*=2.15) has less SS errors than the >180 wpm group (*M*=4.06, *SD*=2.03), *p*=.01. The 120-140 wpm group has more SS errors than the 160-180 wpm group, but there was no statistically significant result.

The 140-160 wpm group (*M*= 1.79, *SD*= 1.54) has statistically significant less SS errors than the 120-140 wpm group (*M*= 3.07, *SD*= 2.15), *p*=.00, and the >180 wpm group (*M*= 4.06, *SD*= 2.03), *p*=.00. The 140-160 wpm group has less SS errors than the <100 wpm group and the 160-180 wpm group, but the results did not reach statistical significance.

The 160-180 wpm group (*M*= 2.50, *SD*= 1.91) has statistically significant less SS errors than the >180 wpm group (*M*= 4.06, *SD*= 2.03), *p*=.00. The 160-180 wpm has more SS errors than the <100 wpm group and the 140-160 wpm group, but the results did not show statistical significance. The 160-180 wpm group has less SS errors than the 120-140 wpm group, but there was also no statistical significance.

The >180 wpm group (*M*= 4.06, *SD*= 2.03) has more SS errors than all the other groups, the <100 wpm group (*M*= 2.11, *SD*= 1.65), *p*=.00, the 120-140 wpm group (*M*= 3.07, *SD*= 2.15),

p=.01, the 140-160 wpm group (*M*= 1.79, *SD*= 1.54), *p*=.00, and the 160-180 wpm group (*M*= 2.50, *SD*= 1.91), *p*=.00.

Table 4.21 One-way ANOVA result of speed rates and substitution of segment
ANOVA

Substitution of segment

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	214.745	4	53.686	15.365	.000**
Within Groups	1198.485	343	3.494		
Total	1413.230	347			

*Note. * p < .05; ** p < .01*

Table 4.22 M and SD of One-way ANOVA result of speed rates and substitution of segment
Descriptives

Substitution of segment

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
<100 wpm	112	2.11	1.651	.156	1.80	2.42	0	8
120-140 wpm	90	3.07	2.156	.227	2.62	3.52	0	8

140-160 wpm	56	1.79	1.546	.207	1.37	2.20	0	7
160-180 wpm	28	2.50	1.915	.362	1.76	3.24	0	7
>180 wpm	62	4.06	2.031	.258	3.55	4.58	0	9
Total	348	2.68	2.018	.108	2.47	2.90	0	9

Figure 4.14 Mean of substitution of segment across different speed groups

4.3.4 One-way ANOVA of experiments and error types

This section presents the one-way ANOVA results of the three experiments and the error types. The following sections will include: experiments and omission of word, experiments and omission of segment, experiments and substitution of word, and experiments and substitution of segment.

Figure 4.15 Variables within one-way ANOVA of experiments and error types

Error types across all three experiments: omission of word, omission of segment, substitution of word, substitution of segment

Compared with

All three experiments

Experiment 3 has the most omission of segment error and substitution of segment error, corresponding with the speech rates results mentioned in the previous section.

4.3.4.1 Experiments and omission of word

Table 4.23 shows the effect of experiments and the omission of word (OW) error type. Table 4.24 shows the *M* and the *SD* of the omission of word error from all participants, Figure 4.16 shows the Mean of the omission of error across all three experiments. A one-way ANOVA

test revealed that there was a statistically significant difference between the groups, $(F(2, 345) = 8.351, p=.00)$.

A Tuckey post hoc test was performed to show the difference between the groups. Experiment 1 ($M=.31$, $SD=.52$) has statistically significant lower OW errors than Experiment 2 ($M=.69$, $SD=.78$), $p=.00$. Experiment 1 also has lower OW errors than Experiment 3 ($M=.48$, $SD=.72$), but the result was not significant, $p=.13$.

Experiment 2 has more OW errors than Experiment 3, but the result was not significant, $p=.06$. Out of the three experiments, Experiment 2 has the most omission of word errors.

Table 4.23 One-way ANOVA result of experiments and omission of word
ANOVA

Omission of word

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.896	2	3.948	8.351	.000**
Within Groups	163.093	345	.473		
Total	170.989	347			

*Note. * p < .05; ** p < .01*

Table 4.24 M and SD of One-way ANOVA result of experiments and omission of word

Descriptives

Omission of word

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	112	.31	.520	.049	.22	.41	0	2
2	112	.69	.783	.074	.54	.83	0	3
3	124	.48	.727	.065	.35	.61	0	3
Total	348	.49	.702	.038	.42	.57	0	3

Figure 4.16 Mean of omission of word across different experiments

4.3.4.2 Experiments and omission of segment

Table 4.25 shows the effect of experiments and the omission of segment (OS) error types. Table 4.26 shows the *M* and the *SD* of the omission of segment error from all participants. A one-way ANOVA test revealed that there was a statistically significant difference between the groups, (F (2, 345) = 134.097, *p*=.00). Figure 4.17 shows that Experiment 3 has the most error rate out of all three experiments.

A Tuckey post hoc test was performed to determine the difference between the groups. Experiment 1 (*M*=1.79, *SD*=1.65) has statistically significant lower OS errors than Experiment 2 (*M*=6.98, *SD*=3.54), *p*=.00, as well as Experiment 3 (*M*=8.60, *SD*=4.11), *p*=.00.

Experiment 2 (*M*=6.98, *SD*=3.54) has statistically significant lower OS errors than Experiment 3 (*M*=8.60, *SD*=4.11), *p*=.00.

Experiment 3 (*M*=8.60, *SD*=4.11) has the highest amount of OS errors out of the three experiments.

Table 4.25 One-way ANOVA result of experiments and omission of segment
ANOVA

Omission of segment

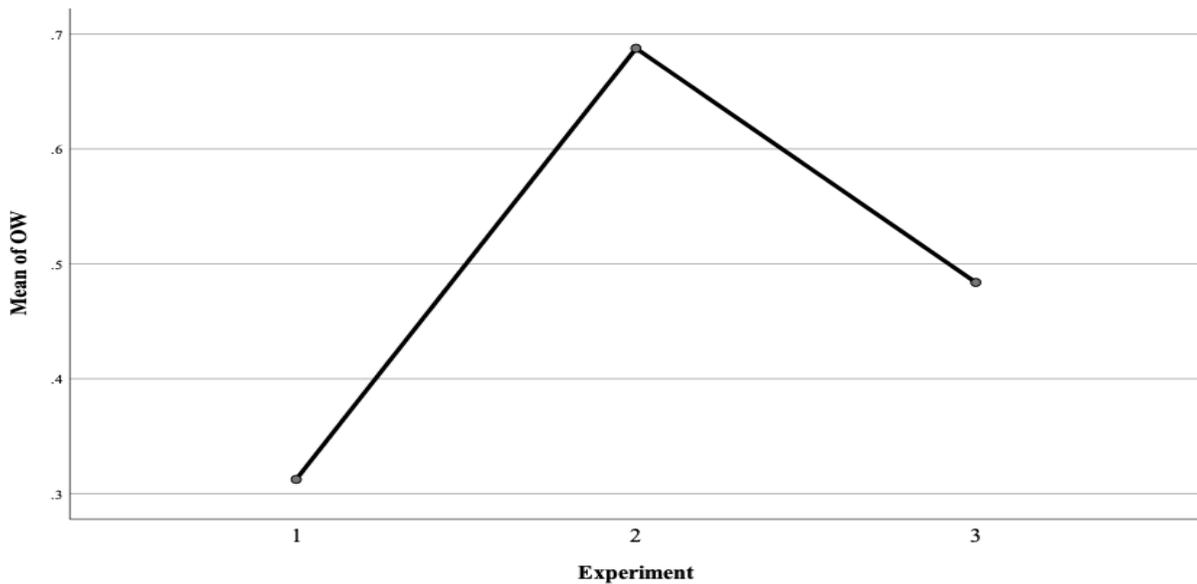|	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2934.171	2	1467.085	134.097	.000**
Within Groups	3774.459	345	10.940		
Total	6708.629	347			

*Note. * p < .05; ** p < .01*

Table 4.26 *M* and *SD* of One-way ANOVA result of experiments and omission of segment

Descriptives

OS

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1	112	1.79	1.657	.157	1.48	2.10	0	8
2	112	6.98	3.541	.335	6.32	7.65	0	21
3	124	8.60	4.110	.369	7.87	9.34	0	23
Total	348	5.89	4.397	.236	5.42	6.35	0	23

Figure 4.17 Mean of omission of segment across different experiments

4.3.4.3 Experiments and substitution of word

Table 4.27 shows the effect of experiments and the substitution of word (SW) error type. Table 4.28 shows the *M* and the *SD* of the substitution of word error from all participants, Figure 4.18 shows the Mean of the substitution of word error across all three experiments. A one-way ANOVA test showed that there was no statistically significant difference between the groups, (F (2, 345) = 2.196, *p*=.11).

A Tuckey post hoc test was administered to further examine the difference between the groups even though the there was no statistically significant difference between the groups. Experiment 1 has the most amount of substitution of word errors and Experiment 3 has the least amount of substitution of word errors, albeit all groups had no statistically significant difference. Experiment 2 has less SW errors than Experiment 1, and higher SW errors than Experiment 3, but the results did not reach statistical significance.

Table 4.27 One-way ANOVA result of experiments and substitution of word
ANOVA

Substitution of word

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.553	2	2.777	2.196	.113
Within Groups	436.194	345	1.264		
Total	441.747	347			

*Note. * p < .05; ** p < .01*

138

Table 4.4 *M* and *SD* of One-way ANOVA result of experiments and substitution of word

Descriptives

Substitution of word

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Max.
1	112	1.19	1.418	.134	.92	1.45	0	6
2	112	1.16	1.000	.095	.97	1.35	0	4
3	124	.91	.911	.082	.75	1.07	0	4
Total	348	1.08	1.128	.060	.96	1.20	0	6

Figure 4.18 Mean of substitution of word across different experiments

4.3.4.4 Experiments and substitution of segment

Figure 4.19 show the effect of experiments and the substitution of segment (SS) error type. Table 4.30 shows the *M* and the *SD* of the substitution of segment error from all participants. A one-way ANOVA test showed that there was a statistically significant difference between the groups, (F (2, 345) = 78.166, *p*=.00), see Table 4.29.

A Tuckey post hoc test was performed to determine the difference between the groups.

Experiment 1 (*M*=1.31, *SD*=1.23) has statistically significant less SS errors than Experiment 2 (*M*=2.55, *SD*=1.78), *p*=.00, as well as Experiment 3 (*M*=4.04, *SD*=1.91), *p*=.00.

Experiment 2 (*M*=2.55, *SD*=1.78) has statistically significant less SS errors than Experiment 3 (*M*=4.04, *SD*=1.91), *p*=.00. Experiment 2 (*M*=2.55, *SD*=1.78) has statistically more SS errors than Experiment 1 (*M*=1.31, *SD*=1.23), *p*=.00.

Experiment 3 (*M*=4.04, *SD*=1.91) has statistically significant more SS errors than Experiment 1 (*M*=1.31, *SD*=1.23), *p*= .00, and Experiment 2 (*M*=2.55, *SD*=1.78), *p*=.00.

Out of all three experiments, Experiment 1 has the least amount of SS while Experiment 3 has the highest amount of SS errors.

Table 4.5 One-way ANOVA result of experiments and substitution of segment
ANOVA

Substitution of segment

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	440.690	2	220.345	78.166	.000**

			Std.		Lower	Upper		
Within Groups	972.539	345	2.819					
Total	1413.230	347						

Table 4.30 *M* and *SD* of One-way ANOVA result of experiments and substitution of segment
Descriptives

Substitution of segment

			Std.		95% Confidence Interval for Mean			
					Lower	Upper		
	N	Mean	Deviation	Std. Error	Bound	Bound	Minimum	Maximum
1	112	1.31	1.230	.116	1.08	1.54	0	5
2	112	2.55	1.780	.168	2.22	2.89	0	8
3	124	4.04	1.919	.172	3.70	4.38	0	9
Total	348	2.68	2.018	.108	2.47	2.90	0	9

Figure 4.19 Mean of substitution of segment across different experiments

4.3.5 One-way ANOVA of speech rates and CI note types

This section presents one-way ANOVA result of the effect of speech rates and the CI note types of participants. During the collection of the notes, only notes from Experiment 2 and Experiment 3 were collected. Experiment 1 notes were not collected due to the fact that during Experiment 1, the students were not yet familiar with the note-taking needs of CI, and some of them did not show up to class with paper and pen.

Figure 4.20 Variables within the one-way ANOVA of speech rates and CI note types

CI note types:

SL vs. TL,

full-word vs. abbreviation

language vs. symbols,

numbers,

segmentation

Compared with

All speech rates across three experiments.

Trainees took more TL(Mandarin) notes during the 120-140 wpm group, but more SL (English) during the >180 wpm group. When the speed is too fast or too slow, such as <100 wpm, segmentation would also be less in CI notes.

There are five types of CI notes categories taken under consideration: source language vs. target language; full words vs. abbreviation; symbols vs. language; segmentation; numbers. This section can be divided into: speed rates and source language vs. target language, speed rates and full words vs. abbreviation, speed rates and symbols vs. language, speed rates and segmentation, and speed rates and numbers.

4.3.5.1 Speed rates and its impact on source language and target language

Table 4.31 shows the effect of speed rates on the types of CI notes participants taken down, specifically focusing on choosing the source language (SL) or target language (TL). Table 4.32 shows the *M* and the *SD* of the participants, Figure 4.21 and Figure 4.22 shows the *M* of the usage of both SL and TL in Experiment 2 and Experiment 3. A one-way ANOVA test showed

that there was statistical significance between different speech rate groups when using SL, (F (4, 231) =10.991, p=.00; there was also a statistical significance between different speech rate groups for using TL, (F (4, 231) =3.963, p=.00.

When looking at the use of SL, a Tuckey post hoc test was performed to determine the difference between different speech rate groups. The <100 wpm group (M=8.64, SD=2.33), has statistically significant lower use of SL than the 120-140 wpm group (M=10.38, SD=2.53), p=.00 and the 140-160 wpm group (M=11.10, SD=3.52), p=.00. The <100 wpm group has lower use of SL than the 160-180 wpm group, but there was no statistical significance. The <100 wpm group has more use of SL than the >180 wpm group, but there was also no statistical significance.

The 120-140 wpm group (M= 10.38, SD= 2.53), has more use of SL than the <100 wpm group (M= 8.64, SD= 2.33), p=.00 and the >180 wpm group (M= 8.03, SD= 2.36), p=.00. The 120-140 wpm group has less use of SL than the 140-160 wpm group, but the statistical result did not reach significance. The 140-160 wpm group has more use of SL than the 160-180 wpm group, but there was also no statistically significant result.

The 160-180 wpm group (M= 9.46, SD= 2.33) has more use of SL than the <100 wpm group and the >180 wpm group, but there was no statistical significance. The 160-180 wpm group has less use of SL than the 120-140 wpm group and the 140-160 wpm group, but there was also no statistical significance.

The >180 wpm group (M= 8.03, SD= 2.36) has less use of SL than the 120-140 wpm group (M= 10.38, SD= 2.53), p=.00 and the 140-160 wpm group (M= 11.10, SD= 3.52), p=.00. The >180 wpm group has less use of SL than the <100 wpm group and the 160-180 wpm group, but there was no statistical significance. Table 4.31 shows the one-way ANOVA results of the

SL and TL usage across different speech rate groups. Table 4.32 shows the *M* and *SD* of SL and TL usage in Experiment 2 & Experiment 3. Figure 4.21 shows the plot chart of *M* for SL. Figure 4.22 shows the plot chart of *M* for TL.

Table 4.31 One-way ANOVA result of SL & TL usage
ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
SL	Between Groups	289.446	4	72.361	10.991	.000**
	Within Groups	1520.774	231	6.583		
	Total	1810.220	235			
TL	Between Groups	87.155	4	21.789	3.963	.004**
	Within Groups	1269.980	231	5.498		
	Total	1357.136	235			

*Note. * $p < .05$; ** $p < .01$*

Table 4.32 *M* and *SD* of SL &TL usage in Experiment 2 & Experiment 3

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min.	Max.
						Lower Bound	Upper Bound		
SL	<100 wpm	56	8.64	2.331	.311	8.02	9.27	2	13
	120-140 wpm	61	10.38	2.531	.324	9.73	11.03	5	16
	140-160 wpm	29	11.10	3.529	.655	9.76	12.45	2	16
	160-180 wpm	28	9.46	2.333	.441	8.56	10.37	6	13
	>180 wpm	62	8.03	2.368	.301	7.43	8.63	2	14
	Total	236	9.33	2.775	.181	8.97	9.69	2	16
TL	<100 wpm	56	2.52	2.272	.304	1.91	3.13	0	9
	120-140 wpm	61	3.49	2.618	.335	2.82	4.16	0	9
	140-160 wpm	29	2.41	2.228	.414	1.57	3.26	0	7
	160-180 wpm	28	1.75	1.351	.255	1.23	2.27	0	5
	>180 wpm	62	3.37	2.517	.320	2.73	4.01	0	11
	Total	236	2.89	2.403	.156	2.58	3.20	0	11

Figure 4.21 Mean of the SL usage in Experiment 2 & Experiment 3

When it comes to the use of TL, a Tuckey post hoc test was also performed to determine the use of TL between the different speech rate groups. The <100 wpm group used less TL than the 120-140 wpm group and the >180 wpm group, but there was no statistically significant result. The <100 wpm group used more TL than the 140-160 wpm group and the 160-180 wpm group, but there was also no statistically significant result.

The 120-140 wpm group used (*M*= 3.49, *SD*= 2.61) has more TL than the 160-180 wpm group (*M*= 9.46, *SD*= 2.33), *p*=.01. The 120-140 wpm group used more TL than the <100 wpm group, the 140-160 wpm group, and the >180 wpm group, but there was no statistically significant result.

The 140-160 wpm group has less use of TL than the <100 wpm group, the 120-140 wpm group, and the >180 wpm group, but there was no statistically significant result. The 140-160

wpm group has more use of TL than the 160-180 wpm group, but there was also no statistically significant result.

The 160-180 wpm group (M= 1,75, SD= 1.35) has less use of TL than the 120-140 wpm group (M= 3.49, SD= 2.61), p=.01, the >180 wpm group (M= 3.37, SD= 2.51), p=.02. The 160-180 wpm group has less use of TL than the <100 wpm group and the 140-160 wpm group, but there was no statistically significant result.

The >180 wpm group (M= 3.37, SD= 2.51) has more use of TL than the 160-180 wpm group (M= 1.75, SD= 1.35), p=.02. The >180 wpm group has more use of TL than the <100 wpm group and the 140-160 wpm group, but there was no statistically significant result. The >180 wpm group has less use of TL than the 120-140 wpm grou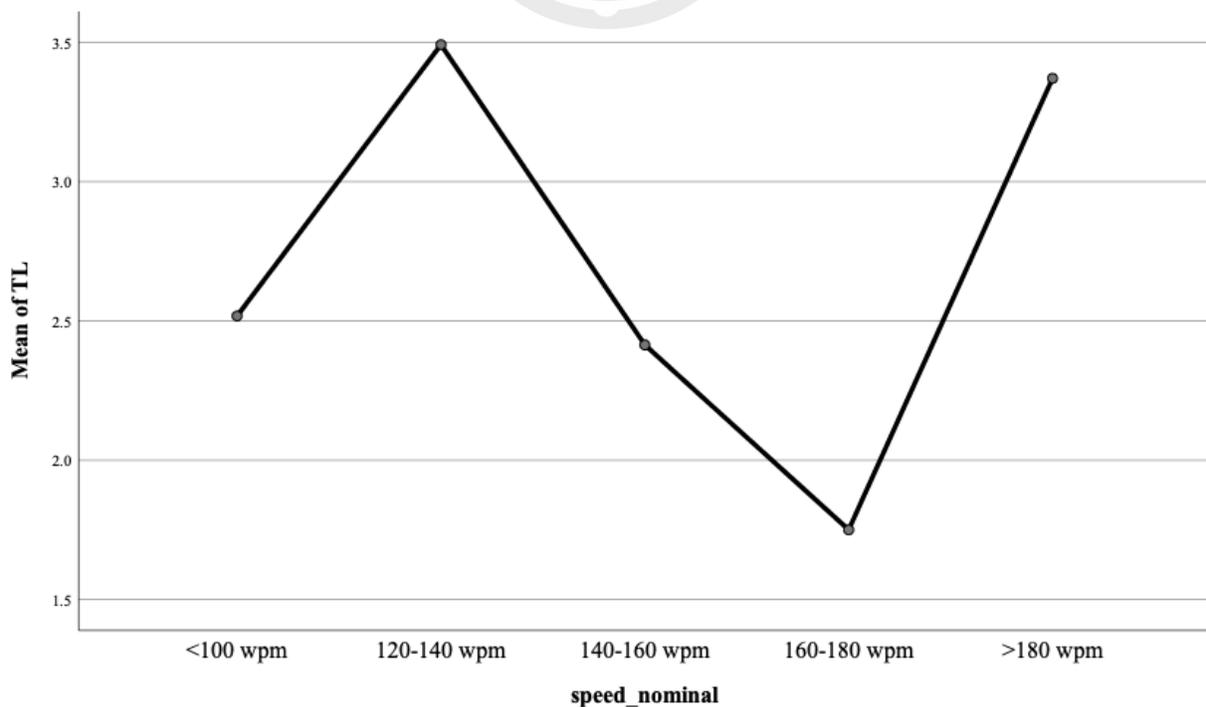p, but there was also no statistically significant result. Figure 4.22 shows the plot chart of M of the TL in Experiment 2 & Experiment 3.

Figure 4.22 Mean of TL usage in Experiment 2 & Experiment 3

4.3.5.2 Speed rates and full words vs. abbreviation

Table 4.33 shows the effect of speed rates on the types of CI notes participants have taken down, focusing on the full words versus abbreviation category. Table 4.34 shows the *M* and *SD* of the participants, Figure 4.23 shows the mean of the use of full word and Figure 4.24 shows the Mean of the use of abbreviations in Experiment 2 and Experiment 3. A one-way ANOVA test revealed that there was a statistically significant difference for full words, (F (4, 231) = 8.614, *p*=.00) and there was no statistical significance for abbreviation, (F (4, 231)= 1.579, *p*=.18).

When examining the usage of full word, a Tuckey post hoc test was performed to determine the difference between the groups.

The <100 wpm group (*M*= 4.77, *SD*= 2.59) has less use of full words than the 120-140 wpm group (*M*= 7.10, *SD*= 2.03), *p*=.00 and the 140-160 wpm group (*M*= 6.45, *SD*= 3.12), *p*=.01. The <100 wpm group has less use of full words than the 160-180 wpm group and the >180 wpm group, but there was no statistical significance.

The 120-140 wpm group (*M*= 7.10, *SD*= 2.03) has more use of full words than the <100 wpm group (*M*=4.77, *SD*= 2.59), *p*.00, the 160-180 wpm group (*M*= 4.93 *SD*= 2.49), *p*=.00, and the >180 wpm group (*M*= 5.84, *SD*= 2.00), *p*=.03. The 120-140 wpm group has more use of full words than the 140-160 wpm group, but there was no statistically significant result.

The 140-160 wpm group (*M*= 6.45, *SD*= 2.59) has more use of full words than the <100 wpm group (*M*=4.77 *SD*= 2.59), *p*=.01. The 140-160 wpm group has less use of full words than the 120-140 wpm group, but there was no statistically significant result. The 140-160 wpm group

has more use of full words than the 160-180 wpm group and the >180 wpm group, but there was also no statistically significant result.

The 160-180 wpm group (*M*= 4.93, *SD*= 2.49) has statistically significant less use of full words than the 120-140 wpm group (*M*= 7.10, *SD*= 2.03), *p*=.00. The 160-180 wpm group has more use of full words than the <100 wpm group, but there was no statistical significance. The 160-180 wpm group has less use of 140-160 wpm group and the >180 wpm group, but there was also no statistically significant result.

The >180 wpm group (*M*= 5.84, *SD*= 2.00) has less use of full words than the 120-140 wpm group (*M*= 7.10, *SD*= 2.03), *p*=.03. The >180 wpm group has more use of full words than the <100 wpm group and the 160-180 wpm group, but there was no statistical significance. The >180 wpm group has less use of full words than the 140-160 wpm group, but there was also no statistical significance.

Table 4.33 One-way ANOVA result of the use of full-word & abbreviation in Exp 2 & Exp 3
ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
full	Between Groups	194.628	4	48.657	8.614	.000**
	Within Groups	1304.809	231	5.649		
	Total	1499.436	235			
abbreviation	Between Groups	42.446	4	10.612	1.579	.181

				Std.		95% Confidence Interval for Mean			
				Std.		Interval for Mean			
				Deviatio	Std.	Lower	Upper		
		N	Mean	n	Error	Bound	Bound	Min.	Max.

	Within Groups	1552.448	231	6.721					
	Total	1594.894	235						

Table 4.34 *M* and *SD* of One-way ANOVA result of the use of full-word & abbreviation in Exp 2 & Exp 3

Descriptives

		N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Min.	Max.
full	<100 wpm	56	4.77	2.594	.347	4.07	5.46	0	11
	120-140 wpm	61	7.10	2.039	.261	6.58	7.62	2	13
	140-160 wpm	29	6.45	3.123	.580	5.26	7.64	0	12
	160-180 wpm	28	4.93	2.493	.471	3.96	5.90	1	10
	>180 wpm	62	5.84	2.002	.254	5.33	6.35	2	11

	Total	236	5.88	2.526	.164	5.55	6.20	0	13
abbreviation	<100 wpm	56	4.75	2.176	.291	4.17	5.33	0	9
	120-140 wpm	61	5.66	2.921	.374	4.91	6.40	0	14
	140-160 wpm	29	4.97	2.625	.487	3.97	5.96	1	13
	160-180 wpm	28	4.93	2.260	.427	4.05	5.80	1	10
	>180 wpm	62	4.55	2.714	.345	3.86	5.24	0	13
	Total	236	4.98	2.605	.170	4.64	5.31	0	14

Figure 4.23 Mean of the use of full-word in Experiment 2 and Experiment 3

When looking at the use of abbreviation in CI notes, there was no statistical significance across the different speech rate groups among Experiment 2 and Experiment 3. The >180 wpm has less usage of abbreviation than the <100 wpm group, the 120-140 wpm group, the 140-160 wpm group, and the 160-180 wpm group. However, the results did not show statistical significance.

The <100 wpm group used less abbreviation than the 120-140 wpm group, the 140-160 wpm group, and the 160-180 wpm group, but there was no statistically significant result. The <100 wpm group has more use of abbreviation than the >180 wpm group, but the result also did not show significance.

The 120-140 wpm group has more usage of abbreviation than the <100 wpm group, the 140-160 wpm group, the 160-180 wpm group, and the >180 wpm group, but the results did not reach statistical significance.

The 140-160 wpm group has more use of abbreviation than the <100 wpm group, the 160-180 wpm group, and the >180 wpm group, but there was no statistical significance. The 140-160 wpm group has less use of abbreviation than the 120-140 wpm group, but there was also no statistical significance.
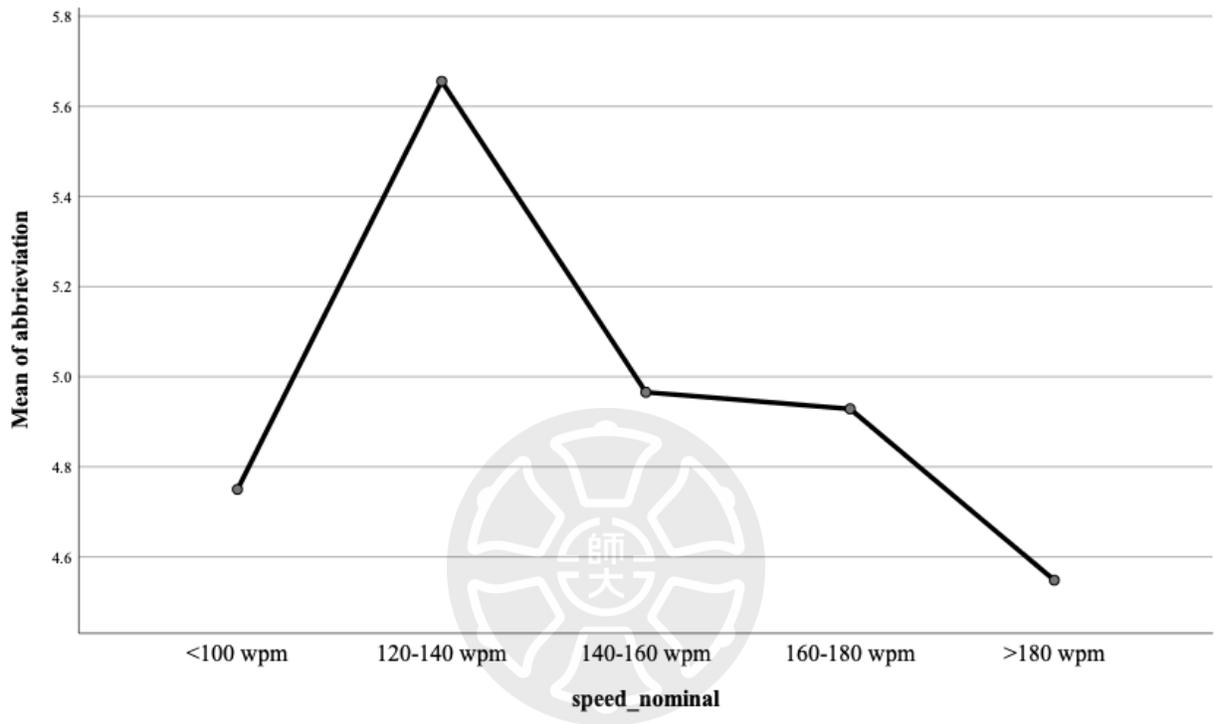
The 160-180 wpm group has more use of abbreviation than the <100 wpm group and the >180 wpm group, but there was no statistical significance. The 160-180 wpm group has less use of abbreviation than the 120-140 wpm group and the 140-160 wpm group, but there was also no statistically significant result.

The 180 wpm group has less usage of abbreviation than all the other speech rate groups, the <100 wpm group, 120-140 wpm group, 140-160 wpm group, and the 160-180 wpm group, but the results were not statistically significant.

Figure 4.24 Mean of the use of abbreviation across Experiment 2 and Experiment 3

4.3.5.3 Speed rates and its impact on language and symbols

Table 4.35 shows the effect of the speed rates on the participants CI notes usage of language and symbols. Table 4.36 shows the *M* and the *SD* of the use of language and symbols in Experiment 2 and Experiment 3.

A one-way ANOVA revealed that there was a statistically significant difference between the groups for using language, $(F_{(4, 79)} = 7.455, p=.00)$, and there was also a statistically significance difference for using symbol, $(F_{(4, 231)} = 18.515, p=.00)$.

Considering use of language, A Tukey post hoc test was applied to determine the differences.

The <100 wpm group (M= 10.95, SD= 2.35) has statistically significant less use of language than the 120-140 wpm group (M= 14.68, SD= 3.21), p=.00 and the 140-160 wpm group (M= 14.40, SD= 2.63), p=.01. The <100 wpm group has more use of language than the 160-180 wpm group, but there was no statistical significance. The <100 wpm group has less use of language than the >180 wpm group, but there was also no statistical significance.

The 120-140 wpm group (M= 14.68, SD= 3.21) has statistically significant more use of language than the <100 wpm group (M= 10.95, SD= 2.35), p=.00, the 160-180 wpm group (M= 10.90, SD= 2.92), p=.00, and the >180 wpm group (M= 11.59, SD= 2.72), p=.00. The 120-140 wpm group has more use of language than the 140-160 wpm group, but the results did not reach statistical significance.

The 140-160 wpm group (M= 14.40, SD= 3.21) has more use of language than the <100 wpm group (M= 10.95, SD= 2.35), p=.01 and the 160-180 wpm group (M= 10.90, SD= 2.92), p=.04. The 140-160 wpm group has less use of language than the 120-140 wpm, but there was no statistical significance. The 140-160 wpm group has more use of language than the >180 wpm group, but there was also no statistically significant result.

The 160-180 wpm group (M= 10.90, SD= 2.92) has less use of language than the 120-140 wpm group (M= 14.68, SD= 3.21), p=.00 and the 140-160 wpm group (M= 14.40, SD= 2.63), p=.04. The 160-180 wpm group has less use of language than the <100 wpm group and the >180 wpm group, but there was no statistically significant result.

The >180 wpm group (*M*= 11.59, *SD*= 2.72) has less use of language than the 120-140 wpm group (*M*= 14.68, *SD*= 3.21), *p*=.00. The >180 group has more use of language than the <100 wpm group and the >180 wpm group, but there was no statistical significance. The >180 wpm group has less use of language than the 140-160 wpm group, but there was also no statistical significance.

Table 4.35 One-way ANOVA result of the use language and symbols in Exp 2 & Exp 3
ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
language	Between Groups	232.659	4	58.165	7.455	.000**
	Within Groups	616.341	79	7.802		
	Total	849.000	83			
symbols	Between Groups	564.223	4	141.056	18.515	.000**
	Within Groups	1759.824	231	7.618		
	Total	2324.047	235			

*Note. * p < .05; ** p < .01*

Table 4.36 *M* and *SD* of One-way ANOVA result of the use of language and symbols

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min.	Max.
						Lower Bound	Upper Bound		
language	<100 wpm	20	10.95	2.350	.526	9.85	12.05	7	17
	120-140wpm	22	14.68	3.213	.685	13.26	16.11	10	23
	140-160wpm	10	14.40	2.633	.833	12.52	16.28	11	18
	160-180wpm	10	10.90	2.923	.924	8.81	12.99	7	16
	>180 wpm	22	11.59	2.720	.580	10.39	12.80	8	17
	Total	84	12.50	3.198	.349	11.81	13.19	7	23
symbols	<100 wpm	56	2.77	2.335	.312	2.14	3.39	0	8
	120-140wpm	61	6.97	3.266	.418	6.13	7.80	1	15
	140-160wpm	29	4.72	2.776	.516	3.67	5.78	0	10
	160-180wpm	28	3.89	2.885	.545	2.77	5.01	0	10
	>180 wpm	62	5.47	2.494	.317	4.83	6.10	0	10
	Total	236	4.94	3.145	.205	4.53	5.34	0	15

Figure 4.25 Mean of the use of language across Experiment 2 and Experiment 3

When examining the usage of symbols, a Tuckey post hoc test was used to determine the differences between the groups.

The <100 wpm group (M= 2.77, SD= 2.33) has statistically significant less use of symbols than the 120-140 wpm group (M= 6.97, SD= 3.22), p=.00, the 140-160 wpm group (M= 4.72, SD= 2.77), p=.01, and the >180 wpm group (M= 5.47, SD= 2.49), p=.00. The <100 wpm group has less use of symbols than the 160-180 wpm group, but there was no statistical significance.

The 120-140 wpm group (M= 6.97, SD= 3.26) has statistically significant more use of symbols than the <100 wpm group (M= 2.77, SD= 2.33), p=.00, the 140-160 wpm group (M= 4.72, SD= 2.77), p=.00, the 160-180 wpm group (M= 3.89, SD= 2.88), p=.00, and the >180 wpm
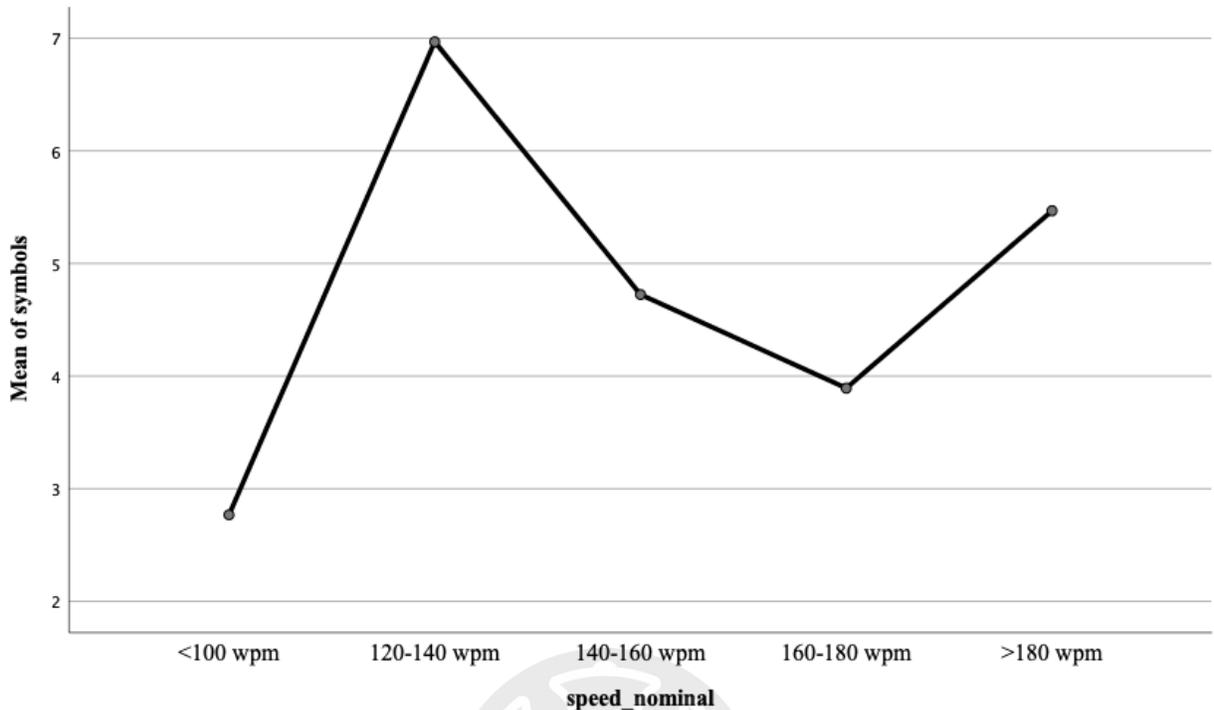
group (*M*= 5.47, *SD*= 2.49), *p*=.02. In short, the 120-140 wpm group has statistically significant more use of symbols than the other speech rate groups.

The 140-160 wpm group (*M*= 4.72, *SD*= 2.77) has statistically significant more use of symbols than the <100 wpm group (*M*= 2.77, *SD*= 2.33), *p*=.01. The 140-160 wpm group (*M*= 4.72, *SD*= 2.77) has statistically significant less use of symbols than the 120-140 wpm group (*M*= 6.97, *SD*= 3.26), *p*=.00. The 140-160 wpm group has more use of symbols than the 160-180 wpm group, but there was no statistical significance. The 140-160 wpm group has less use of symbols than the >180 wpm group, but there was also no statistical significance.

The 160-180 wpm group (*M*= 3.89, *SD*= 2.88) has less use of symbols when compared to the 120-140 wpm group (*M*= 6.97, *SD*= 3.26), *p*=.00. The 160-180 wpm group has more use of symbols than the <100 wpm group, but there was no statistical significance. The 160-180 wpm group has less use of symbols than the 140-160 wpm group and the >180 wpm group, but there was also no statistical significance.

The >180 wpm group (*M*= 5.47, *SD*= 2.49) has statistically significant more use of symbols than the <100 wpm group (*M*= 2.77, *SD*= 2.33), *p*=.00. The >180 wpm group (*M*= 5.47, *SD*= 2.33) has statistically significant less use of symbols than the 120-140 wpm group (*M*= 6.97, *SD*= 3.26), *p*=.02. The >180 wpm group has more use of symbols than the 140-160 wpm group and the 160-180 wpm group, but there was no statistical significance.

Figure 4.26 Mean of the use of symbols across Experiment 2 and Experiment 3

4.3.5.4 Speed rates and segmentation

Figure 4.27 shows the effect of speed rates on the segmentation of the participants' CI notes. Table 4.38 shows the *M* and the *SD* of the segmentation used by the participants.

A one-way ANOVA shows that there is no statistically significant difference between groups, ($F_{(4, 231)} = .482$, $p= .74$), see Table 4.37.

A Tuckey post hoc test was performed to determine the difference between the groups. The <100 wpm group used less segmentation than the 120-140 wpm group, the 140-160 wpm group, the 160-180 group, and the >180 wpm group, but there was no statistical significance.

The 120-140 wpm group has more use of segmentation than the <100 wpm group and the >180 wpm group, but there was no statistically significant result. The 120-140 wpm group

used less segmentation than the 140-160 wpm group and the 160-180 wpm group, but there was also no statistically significant result.

The 140-160 wpm group has more use of segmentation than the <100 wpm group, the 120-140 wpm group, the 160-180 wpm group, and the >180 wpm group, but there was no statistically significant result.

The 160-180 wpm group has more use of segmentation than the <100 wpm group, the 120-140 wpm group, and the >180 wpm group, but there was no statistically significant result. The 160-180 wpm group has less use of segmentation than the 140-160 wpm group, but there was also no statistically significant result.

The >180 wpm group has more use of segmentation than the <100 wpm group, but the result did not reach statistical significance. The >180 wpm group has less use of segmentation than the 120-140 wpm group, the 140-160 wpm group, and the 160-180 wpm group, but the result also did not reach statistical significance either.

Table 4.37 One-way ANOVA result of the use of segmentation
ANOVA

segmentation

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.743	4	1.936	.482	.749
Within Groups	928.168	231	4.018		
Total	935.911	235			

*Note. * p < .05; ** p < .01*

Table 4.6 *M* and *SD* of One-way ANOVA result of the use of segmentation

Descriptives

segmentation

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min.	Max.
					Lower Bound	Upper Bound		
<100 wpm	56	2.32	1.562	.209	1.90	2.74	0	7
120-140 wpm	61	2.69	2.270	.291	2.11	3.27	0	10
140-160 wpm	29	2.86	1.959	.364	2.12	3.61	0	9
160-180 wpm	28	2.79	1.988	.376	2.01	3.56	0	8
>180 wpm	62	2.61	2.107	.268	2.08	3.15	0	10
Total	236	2.61	1.996	.130	2.36	2.87	0	10

Figure 4.27 Mean of the use of segmentation between Experiment 2 and Experiment 3

4.3.5.5 Speed rates and numbers

Figure 4.28 shows the effect of speed rates on the usage of numbers from participants' CI notes. Table 4.40 shows the M and SD of the results.

A one-way ANOVA test revealed that there is a statistically significant difference between the groups, $(F (4, 231) = 81.707, p=.00)$, see Table 4.37.

A Tukey post hoc test was applied to determine the difference between the groups. The <100 wpm group ($M=.93, SD= 1.14$) has statistically significant less usage of numbers when compared with the 120-140 wpm group ($M= 2.82, SD= 1.19$), $p=.00$. The <100 wpm group ($M= .93, SD= 1.14$) has more statistically significant more use of numbers than the 160-180 wpm group ($M=.04, SD=.64$), $p=.00$ and the >180 wpm group ($M=.27, SD=.48$), $p=.00$. The

<100 wpm has more use of numbers than the 140-160 wpm group, but there was no statistical significance.

The 120-140 wpm group (M=2.82, SD=1.19) has statistically significant more use of numbers than the <100 wpm group (M=.93, SD= 1.14), p=.00, the 140-160 wpm group (M=.72, SD=.64), p=.00, the 160-180 wpm group (M=.04, SD=.18), p=.00, and the >180 wpm group (M=.27, SD=.48), p=.00.

The 140-160 wpm group (M=.72, SD=.64) has statistically significant less usage of numbers when compared with the 120-140 wpm group, (M=2.82, SD=1.19), p=.00. The 140-160 wpm group (M=.72, SD=.64) has statistically significant more use of numbers than the 160-180 wpm group (M=.04, SD=.18), p=.03. The 140-160 wpm group has less use of numbers than the <100 wpm group, but there was no statistical significance. The 140-160 wpm group has more use of numbers than the >180 wpm group, but there was also no statistical significance.

The 160-180 wpm group (M=.04, SD=.18) has statistically significant less use of numbers than the <100 wpm group (M=.93, SD=1.13), p=.00, the 120-140 wpm group (M=2.82, SD=1.19), p=.00, and the 140-160 wpm group (M=.72, SD=.64), p=.03. The 160-180 wpm group has less use of numbers then the >180 wpm group, but there was no statistically significant result.

The >180 wpm group (M=.27, SD=.48) has statistically significant less use of numbers than the <100 wpm group (M=.93, SD=1.14), p=.00 and the 120-140 wpm group (M=2.82, SD=1.19), p=.00. The >180 wpm group has less use of numbers than the 140-160 wpm group, but there was no statistical significance. The >180 wpm group has more use of numbers than the 160-180 wpm group, but there was also no statistical significance.

Table 4.7 One-way ANOVA result of the use of numbers

ANOVA

numbers

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	260.084	4	65.021	81.707	.000**
Within Groups	183.827	231	.796		
Total	443.911	235			

*Note. * p < .05; ** p < .01*

Table 4.8 *M* and *SD* of One-way ANOVA result of the use of numbers

Descriptives

numbers

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min.	Max.
					Lower Bound	Upper Bound		
<100 wpm	56	.93	1.142	.153	.62	1.23	0	4
120-140 wpm	61	2.82	1.190	.152	2.51	3.12	0	5
140-160 wpm	29	.72	.649	.121	.48	.97	0	2
160-180 wpm	28	.04	.189	.036	-.04	.11	0	1

>180 wpm	62	.27	.485	.062	.15	.40	0	2
Total	236	1.11	1.374	.089	.94	1.29	0	2

Figure 4.28 Mean of the use of numbers between Experiment 2 and Experiment 3

4.4 Pre-test questionnaire results

This section discusses the pre-test questionnaire that is focused on the participants' background. The participants from the two schools were all majors of either the foreign language department or English language department, and they were all in their third or fourth year of college.

From the two schools of participants who both majored in English as a foreign language, they were all asked to fill out the length of years they have in learning English, as well as any

type of language proficiency test, they have taken in the past. The questionnaire also asked if they have lived abroad in an English-speaking country, and if so, fill out how many years of their stay.

All of the participants' have taken English proficiency tests of different types, some have taken GEPT, some have taken TOEFL, while others have taken TOEIC. Their results were converted accordingly using the Common European Framework of Reference For Languages: Learning, Teaching, Assessment standard (CEFR). Table 4.41 shows the results of the participants' English proficiency level. It can be seen that the participants' level fall between B2 to C1, which is relatively close in comparison.

Table 4.41 Participant's CEFR level

CEFR level	B1	B2	C1
N	11	10	10

4.5 Post-test questionnaire results

The post-test questionnaires were administered two times for the participants to fill out. The first time was administered at the completion of Experiment 1, and the second time it was administered was at the conclusion of Experiment 3. There was a total of 31 participants that submitted their answers in both questionnaires.

The post-test questionnaire was designed with open-ended questions for the participants to fill out. There were two main objectives of the post-test questionnaire, the first is to find out if the participants can recognize if the speed rates were changed during the experiment, and if so, of the four segments in the experiment, which segments were being slowed down. The second

objective is to question the participants felt that the slower speed rates helped them in anyway. Moreover, the open-ended questions go further in-depth inquiring if the slower speed rates had helped in comprehension, note-taking, recalling, and reproducing. Table __ shows the questions of the open-ended questionnaire administered at Experiment 1.

1. When it comes to consecutive interpreting, do you think that the speaking speed rate of the speaker plays a critical role?

2. During Experiment 1, which is consisted of four segments, can you recognize if there were segments that were slower than the others? If so, please list out which segments were slower?

3. What influence do you think that the slower speed rates have on you?

4. Do the slower speed rates affect your ability to comprehend the speaker, does it aid you or obstruct your understanding?

5. Do slower speed rates affect you in taking down CI notes, and does it help in recalling the content? Or, does the slower speed obstruct you in successfully taking down CI notes, and as a result did not help you in recalling the speech content?
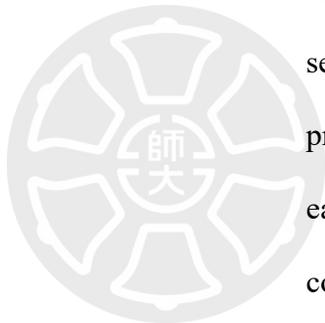
6. Do the slower speed rates help you in reproduction, as in performing your CI task? Or does it obstruct you in completing the task?

Table 4.42 shows the result of the participants' response from Experiment 1.

Table 4.92 Post-test questionnaire results from Experiment 1

Question/Answer				
Q1. When it comes to consecutive interpreting, do you think that the speaking speech rate of the speaker plays a critical role?	Yes- Total of 31 replies.			
Q2. During Experiment 1, which is consisted of four segments, can you recognize if there were segments that were slower than the others? If so, please list out	Not really noticed anything; haven't really noticed; did not notice due to attention occupied by note-taking; (blank, no answer)- Total of 6 replies.	All speech rates were adequate speed - Total of 1 reply.	Yes (but did not provide which segments were slower); yes, segment 2 was slower; yes, all of the speech segments were slower; yes, there were slower segments but cannot	Yes, segments 2 and 4- Total of 3 replies.

which segments were slower?			recall; yes, segment 4; yes, segments 3 and 4; yes, segments 2, 3, and 4; yes, segment 1 and 4; yes, segment 2 and 3; yes, segment 2, 3, and 4; yes, segment 2 but probably due to easier comprehension; yes, segment 1 and 3; yes, segment 1 and 2- Total of 21 replies.	
Q3. What influence do you think that the slower speech	Does not really help with anything; did not feel any effect;	Helped with memorization; felt less nervous; helped with	Helped with comprehension; helped with keeping up with	Helped with note-taking; helped with note-taking

rates have on you?	did not know where is the ending; makes the note-taking speed "too late"- Total of 4 replies.	staying calm to wait- Total of 3 replies.	the speaker; helped in understanding single words- Total of 7 replies.	which also in turn helped in the interpreting stage; helped in note-taking, but sometimes can hinder comprehension due to too slow of speech rate- Total of 17 replies.
Q4. Do the slower speech rates affect your ability to comprehend the speaker, does it aid you or obstruct your understanding?	Did not have any impact; did not feel any impact after getting used to the speaker- Total of 2 replies.	Too slow of a speech rate will negatively affect comprehension- Total of 1 reply.	Slower speech rate can help; slower speech rate can help especially when the speaker has an accent or talked too fast; slower speech rate can help in note-taking and	Slower speech rate does help, but will result in forgetting the previous segments; slower speech rate helps but obstruct the flow and cohesion of sentences;

			comprehension; slower speech rate helps in comprehension and segmentation- Total of 22 replies.	slower speech rate helps comprehension and note-taking but can obstruct memorization- Total of 6 replies.
Q5. Do slower speech rates affect you in taking down CI notes, and does it help in recalling the content? Or, does the slower speed obstruct you in successfully taking down CI notes, and as a result did not help you in	No effect at all- Total of 1 reply.	Slower speech rates help but felt still negatively affected due to unfamiliarity with the note-taking process; able to note down more message but slower speech rate obstructed memory recall; slower speech	Slower speech rates do help with the note-taking process; able to have more time to take down notes; able to note down more details; helps with taking down clearer notes- Total of 23 replies.	

recalling the speech content?		rate helped in noting more details but also resulted in too loose of a segment lacking focus- Total of 7 replies.		
Q6. Do the slower speed rates help you in reproduction, as in performing your CI task? Or does it obstruct you in completing the task?	Slower speech rates impeded the interpreting output process; slower speech rate obstructed recall and therefore impeded the output process- Total of 3 replies.	There was a little bit of a negative effect by the slower speech rates but did not impede output process- Total of 2 replies.	There was no effect on the output process- Total of 7 replies.	Slower speech rates helped with the output process- Total of 19 replies.

Table 4.43 lists the post-test questionnaire questions distributed at Experiment 3. The questions were similar to that of the one filled out at Experiment 1. There was a total of 31 participants who participated in the questionnaire.

1. Do you think that the content was easily comprehensible?

2. Was the topic too difficult? If there were difficulties, can you describe what the difficulties were, as in, the speed of the speaker, accents, etc.?

3. Of the four segments played during Experiment 3, do you think there were any segments that were slower than the others? If so, can you list the segments?

4. Do you think that slower speech rates help in your comprehension?

5. Do you think that slower speech rates help in your note-taking process?

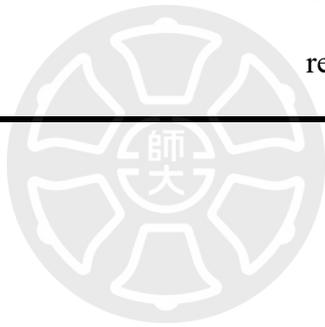6. Do you think that slower speech rates help in your listening and understanding of the content?

Table 4.43 Participants' responses from Experiment 3 post-test questionnaire.

Question/Answer			
Q1. Do you think that the content was easily comprehensible?	No- Total of 1 reply.	Partially, some parts contained too long of a sentence structure that led to less ability to comprehend;	Yes, it was easy to comprehend- Total of 27 replies.

		some parts were too difficult to understand-Total of 3 replies.		
Q2. Was the topic too difficult? If there were difficulties, can you describe what the difficulties were, as in, the speed of the speaker, accents, etc.?	No, it was not too difficult- Total of 9 replies.	Yes, sometimes the speaker can speak too fast- Total of 11 replies.	Yes, numbers can be challenging; yes, the accents can be challenging- Total of 4 replies.	Yes, there were too many details; yes, some parts were unclear for comprehension- Total of 7 replies.
Q3. Of the four segments played during Experiment 3, do you think there were any segments that were slower than the others? If so,	Yes, all of the segments were slower- Total of 3 replies.	No, there were none that were slower speech rates; none that can be noticed- Total of 7 replies.	Yes, only segment 2; yes, only segment 4; yes, segment 1 and 4; yes, segment 3; yes, segment 1 and 3; yes, segment 3-	Yes, segment 2 and 4- Total of 6 replies.

can you list the segments?			Total of 14 replies.
Q4. Do you think that slower speech rates help in your comprehension?	Yes- Total of 26 replies.	Not really, but generally did help; no, didn't need to be slower; no, moderate speech rates were better- Total of 5 replies.	
Q5. Do you think that slower speech rates help in your note-taking process?	Yes, it did help with the note-taking process; yes, it allowed more time to note down details- Total of 26 replies.	No; "Depends, sometimes I will feel boring and finally lost some details"; no, the slower speech rate helped with more time to take down notes but obstructed comprehension-	

	Total of 5 replies.		
Q6. Do you think that slower speech rates help in your listening and understanding of the content?	Yes, it helped with word comprehension and allowed more time to process; yes- Total of 24 replies.	Did not feel any particular influence by the slower speech rate- Total of 2 replies.	No, the speech rates did not need to be too slow; no, being too slow obstructed comprehension- Total of 5 replies.

Chapter 5 Discussion and Conclusion

5.1 Overview of major findings

This chapter is aimed to discuss the results provided in Chapter Four. The focus of the results is to investigate the impact of using slower speech rate materials on interpreter trainees as well as CI notes preferences. The chapter is divided into 5 sections: One-way ANOVA results of speech rates and error rate, One-way ANOVA result of experiments and error rate, One-way ANOVA result of error categories and speech rates, One-way ANOVA result of CI notes and speech rates, and Post-test questionnaires. Table 5.1 provides an overview of the major findings reported in Chapter 4.

Table 5.1 Summary of Major Findings

Slower speech rate impacting trainees' performance		Slower speech rate impacting trainees' CI notes	
Average error rate	yes, mostly slow_1 segment	SL vs. TL	yes
Correlation coefficient	yes, only moderate	full-word vs. abbreviation	yes; no
One-way ANOVA speech rate and error rate	yes	language vs. symbol	yes
One-way ANOVA experiment and error rate	yes	segmentation	no

One-way ANOVA	yes	numbers	yes
speech rate and error			
categories			
One-way ANOVA	yes, except for		
experiments and error	experiment and		
types	substitution of word		

5.2 Error rate of participants

Experiment 1 result

The average error rate from Experiment 1 showed that the error rate did decrease slightly during the first slowed down segment from 50% (E1 original_1) to 31% (E1 slow_1). The E1 slow_1 segment also did not decrease when compared with the subsequent E1 original_2 segment, from 31% to 27%. In addition, the second segment with slower speech rate was not affected, in that the error rate increased instead of a decreased result from 27% (E1 original_2) to 39% (E1 slow_2). Experiment 1 took place at the beginning of their training, approximately after the participants have completed short CI, and just started to learn to do CI notes. It is presumed that during this stage of training, the participants were still getting used to the process of CI, not to mention the simultaneous maneuver of taking down CI notes, so it is possible that the participants experienced fatigue at the last segment (E1 slow_2) of Experiment 1, which could have led to their deteriorated performance in this specific segment (E1 slow_2) despite the slower speech rate.

Experiment 2 result

The average error rate result of Experiment 2 showed that the participants increased their error rate during the first slower speech rate segment (E2 slow_1) from 72% to 81%. However, when comparing the E1 slow_1 segment with the subsequent E2 original_2 segment, it can be seen that the error rate climbed back up as the speech rate increased back to original, from 81% to 87%. Moreover, the error rate during the second slower speed rate segment (E2 slow_2) did not deteriorate and rather maintain the same with the E2 original_2 segment at 87%. The result may indicate that the participants have grown more used to the CI process and were more comfortable in adopting the CI notes system.

Experiment 3 result

The plot chart of mean from Experiment 3 showed that the participants were presumably more adapted to the CI training process. The final experiment took place around the tail end of their training, the participants had gone through more exercises and training courses when compared with the previous two experiments. Results showed that the first slower speech rate segment (E3 slow_1) had fewer average error rate than the previous original speech rate segment (E3 original_1). The E3 slow_1 segment also had lower average error rate when compared with the subsequent original speech rate segment (E3 original_2). During the second slower speech segment (E3 slow_2), the average error rate was also lower than the previous E3 original_2 segment. The results showed that participants took advantage of the slower speech rates segments, in that they committed less errors during the slower speech segments throughout the experiment.

In answering Question one of this research, which was "Does slower speech rate affect interpreter trainees?" Through the results gathered from the three experiments, the answer

seemed to be a positive one. The trainees have performed better especially at the slower speech segments in Experiment 3, which was also around the tail end of their CI training.

All experiment average result

A calculation of the overall experiment speech rates and error rate was also performed, showing that the average error rate during the first slower speech rate segment is lower than the previous original speech rate segment, from 61% (ALL original_1) to 50% (All slow_1). When comparing the first slower speech rate segment with the subsequent original speech rate segment, the average error rate is also lower, from 50% (ALL slow_1) to 59% (ALL original_2). At the second slower speed rate segment (ALL slow_2) it showed that the average error rate was slightly higher than the previous original speech rate segment (ALL original_2). Again, this could be due to the trainees' experiencing fatigue at the tail end of the CI task in Experiment 1 and Experiment 2, causing the ALL slow_2 to err more than the ALL original_2. However, when trainees approached Experiment 3, they seemed to be more well-adjusted to the act of distributing efforts during the CI task, where they were able to utilize the slower speech rates during the experiment better to their advantage and outperformed their results during the original speech rate segments in the same experiment.

5.3 Correlation coefficient result

A Pearson correlation coefficient analysis was applied to examine the relationship between the speech rates and overall error rates. The result showed that there is a positive relationship between speech rates and error rate, but the effect was only at a moderate level at .04. This could possibly be interpreted in two ways: one, the trainees were still getting used to the CI process in the beginning, hence the effect of slower speech rates did not make too much of a difference in the beginning as the trainees were still practicing effort management; two, as later

post-questionnaire answer have showed, some trainees felt that even though the slower speech rates do tend to help, but when the speech rates becomes too slow, it will still impede the memory/ recall process, especially during the Experiment 1 post-test questionnaire. However, in the post-test questionnaire after Experiment 3, even more trainees tended to agree that slower speech rates would be more helpful in completing CI task.

5.4 One-way ANOVA results of speech rates and error rate

The analysis examined the effect of speech rates and error rate, including speech rates from all the three experiments. Results showed that the 120-140 wpm group has the least error rate (48%), while the >180 wpm group has the highest error rate (77%). Moreover, the error rate was more or less around the same range between 52-53% during the <100 wpm and the 140-160 wpm group. Once the speech rate went up to 160-180 wpm and >180 wpm, the error rate picked up immediately to 67% and 77% respectively.

It seems from the present study, the participants performed the best when at speech rate 120-140 wpm, which is similar to Gerver (1969)'s study where simultaneous interpreters also performed better at the 120 wpm speech rate, however the participants in this study were only trainees and performing CI and not SI. The slowest speech rates group, the <100 wpm group, also did not yield better result than the 120-140 wpm group performance. Perhaps this result had to do with the capacity of the participants' working memory insufficient to store information when the speech rate lagged longer at <100 wpm speech rate. This phenomenon is similar to what Chiu (2017) has mentioned in their study, where their SI trainees also experienced extra taxing effort when the speech rate was at 100 wpm.

The two fastest speech rate groups, the 160-180 wpm group and the >180 wpm group, yielded higher error rate compared with the rest of the speech rate group, this is presumably due

to the faster speech rate that caused the participants to commit more errors. Such finding is also similar to the results of Gerver (1969), Barghout et al. (2015), Pio (2003), and Tai (2020). The performance of the trainees according to the speech rate groups can be seen in Table 5.2, with the best performing speech rate group on top.

Table 5.2 Speech rate group ranking according to performance of output

Speech rate group	Performance ranking	Mean of error
120-140 wpm group	1	48.97
140-160 wpm group	2	52.46
<100 wpm group	3	53.68
160-180 wpm group	4	67.24
>180 wpm group	5	77.13

5.5 One-way ANOVA result of experiments and error rate

The result showed that among the three experiments administered, Experiment 3 had the highest error rate, with Experiment 1 the lowest. The sequence of which the experiments took place is also worthy to note, Experiment 1 took place during the beginning of the training, while Experiment 3 took place near the end of the training. Presumably, the participants would have been more familiarized with the CI process and become more equipped to process the incoming speech, but Experiment 3 included the fastest speech rate out of the three experiments (181 wpm and 200 wpm). Hence, the speech rates, albeit at the original pace of the speaker, may have posed as a major obstacle to the trainees even at the later stage of their training.

5.6 One-way ANOVA result of error categories and speech rates

        This section examines the different error categories and the relationship with speech rates. The error categories are divided into: omission of word, omission of segment, substitution of word, and substitution of segment.

Omission of word error result

        When it came to omission of word (OW) errors, the 160-180 wpm group has the highest OW errors, $M= .79$. The >180 wpm group however, has the lowest amount of OW errors. The 160-180 wpm group and the >180 wpm group are the two highest speech rate group of the speech rate groups. But the >180 wpm group has less OW error than the 160-180 wpm group. This could be due to the fact that during the higher speech rates, trainees commit omissions in *longer units*, no longer omitting at a single word level, but rather omitting the entire unit, committing more omission of segment (OS) errors instead.

Omission of segment error result

        When examining the omission of segment (OS) errors, the >180 wpm group has the highest OS error rate, followed by other speech rate groups. Interestingly, in the "omission of segment" error category, the curve of the error rate in the plot chart followed the speech rates. As the speech rate rises, the error rate also rises.

Substitution of word error result

        In the substitution of word (SW) errors, the 160-180 wpm group has the highest SW error rate. The next highest group was the 120-140 wpm group, which also was the group with the overall general error rate as mentioned in earlier section. The other speech rate groups, <100 wpm, the 140-160 wpm group, and the >180 wpm group have similar SW error rate, which was relatively low. This is not to say that the other speech rates would be more better materials in

terms of avoiding SW errors, it is only to reflect that perhaps trainees committed other types of errors in other speech rate groups.

Substitution of segment error result

In the substitution of segment (SS) errors, the >180 wpm group has the highest SS errors, and saliently higher than the other speech rate groups. The next highest group was the 120-140 wpm group, which was the best performing speech rate group of all.

In summation, the error categories show that the speech rates have an impact on the type of errors that trainees would commit. Most observably, the omission of segment (OS) error can be seen climbing up as the speech rate increased. This current research is conducted with an interest of pedagogy and assistance in training purposes. When the trainees commit omission of segment, there were no outputs for the instructor to examine. In contrast, when the trainees commit omission of word error or substitution of word error, it is easier to examine where the trainees may have stumbled during the task. Even with substitution of segment errors, there are traces of ideas presented by the trainees to allow the instructor in understanding their train of thought. But when there is only omission of segment, i.e., a blank space, it can be relatively difficult to determine what other compounding factors there may be that have caused the trainees to come up blank.

5.7 One-way ANOVA result of CI notes and speech rates

This section examines the CI notes of trainees during Experiment 2 and Experiment 3, in order to look at the effect of speech rates on CI notes, if there were any. The CI notes categories can be divided as follow: source language vs. target language, full words vs. abbreviation, symbols vs. language, segmentation, numbers.

SL vs. TL result

In the source language (SL) and target language (TL) comparison category, it was found that there a statistical significance in both the use of source language and the target language.

The >180 wpm group used SL the least, whereas the 140-160 wpm used SL the most. When looking at the <100 wpm notes in TL, the mean was also relatively high, meaning that there were more SL and TL notes taken by the trainees during this speech rate group, <100 wpm.

The 120-140 wpm group was the best performing speech rate group of all, and it used the most amount of TL for CI notes. This is of interesting note, regarding the choice of TL in notes, Tai (2020) mentioned that their participants intended to choose TL as primary choice when taking notes, but when the speech rates went up too fast, they can no longer keep up by using TL and had to use SL instead.

The >180 wpm group also adopted a lot of TL in their notes, but the performance of the group was the worst.

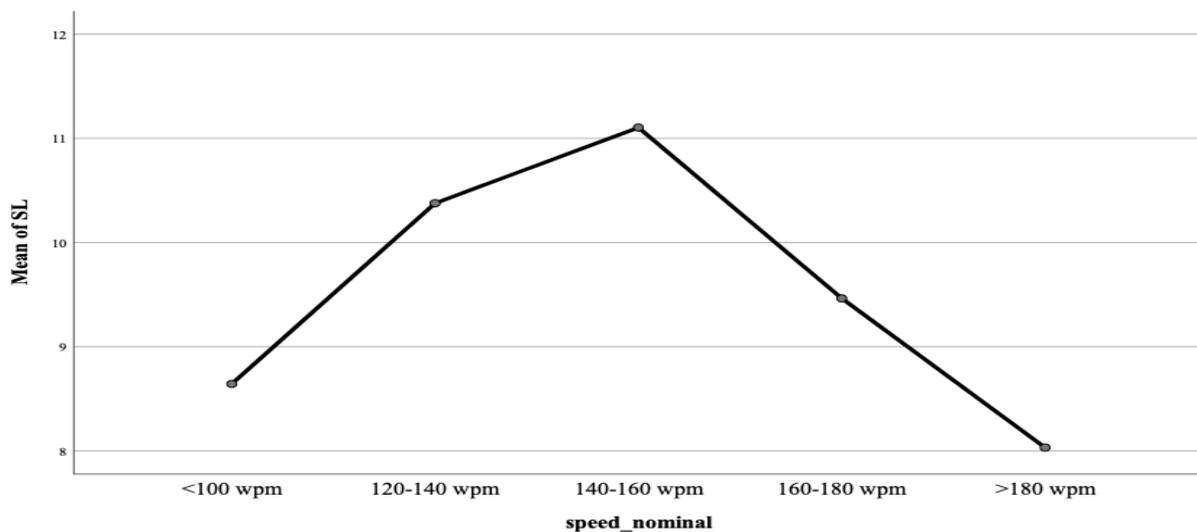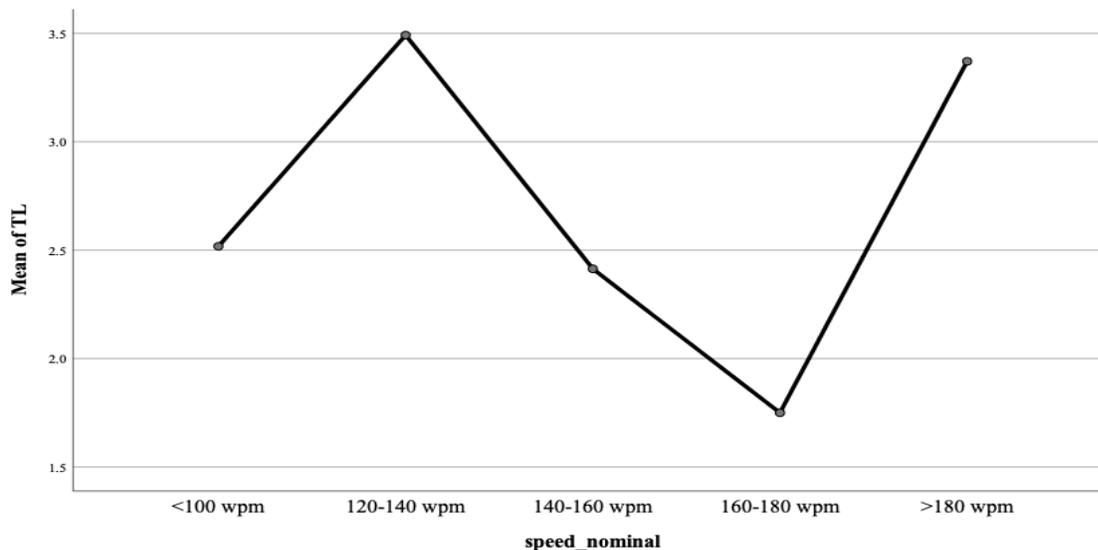Figure 5.1 Mean of the SL usage in Experiment 2 & Experiment 3

Figure 5.2 Mean of TL usage in Experiment 2 & Experiment 3

Full words vs. abbreviation

When it came to the full words and abbreviation comparison, there was a statistical significance in the use of full words between different speech rate groups, there was no statistical significance present in the use of abbreviation.

When looking at the <100 wpm group, there was lesser use of both full words and abbreviation. This could be due to the trainees not familiarized with the CI process yet, as the <100 wpm speech rates occurred mostly during Experiment 1 and Experiment 2 (E1 slow_1, 81.8 wpm; E1 slow_2, 74.7 wpm; E2 slow_1, 97.2 wpm; E2 slow_2, 82.3 wpm). The trainees used the greatest number of full words and abbreviation in the 120-140 wpm group (E1 original_2, 121 wpm; E3 slow_1, 127 wpm; E3 slow_2, 134 wpm), which was also the best performing group. This may be an indication that the 120-140 wpm speech rate group was more ideal for trainees to take notes whether in full-word, or in abbreviation.

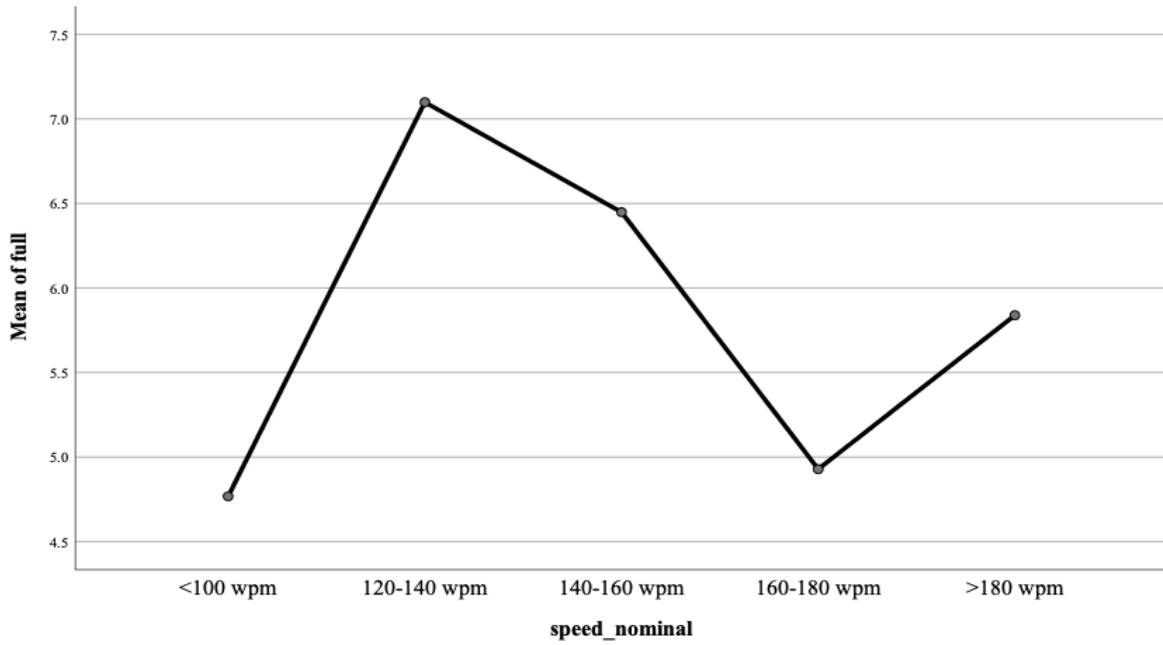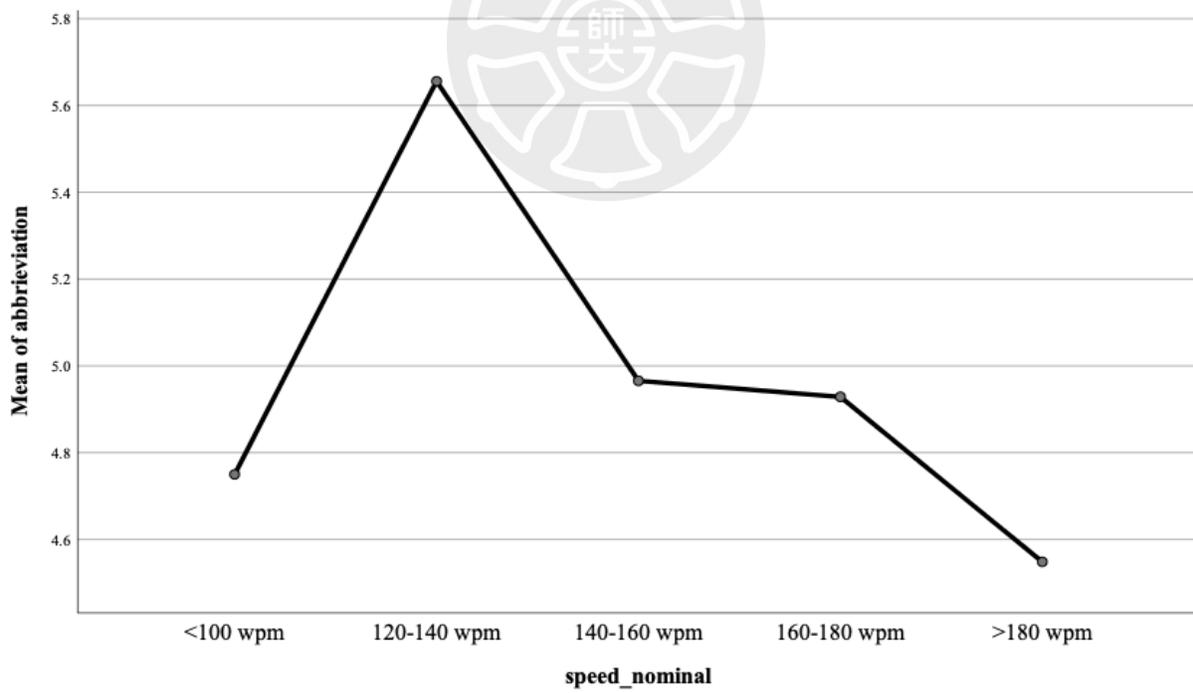Figure 5.29 Mean of the use of full-word in Experiment 2 and Experiment 3

Figure 5.4 Mean of the use of abbreviation across Experiment 2 and Experiment 3

Language vs. symbols

When looking at the language and symbols category, there was also a statistical significance in the language use between different speech rate groups, and there was also a statistical significance in the use of symbols.

In the 120-140 wpm group, there was a higher usage of both language and symbols when compared with other groups. The 140-160 wpm group has a higher use of language instead of symbols. This discrepancy could be due to the difference in speech rates.

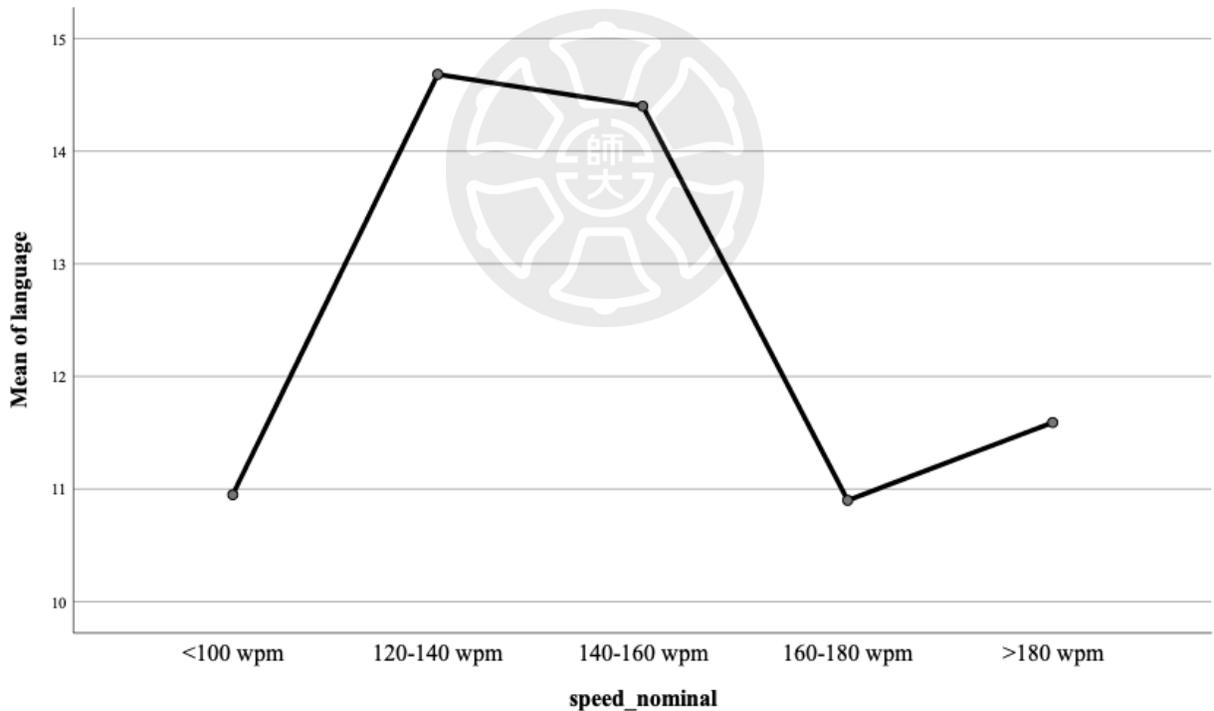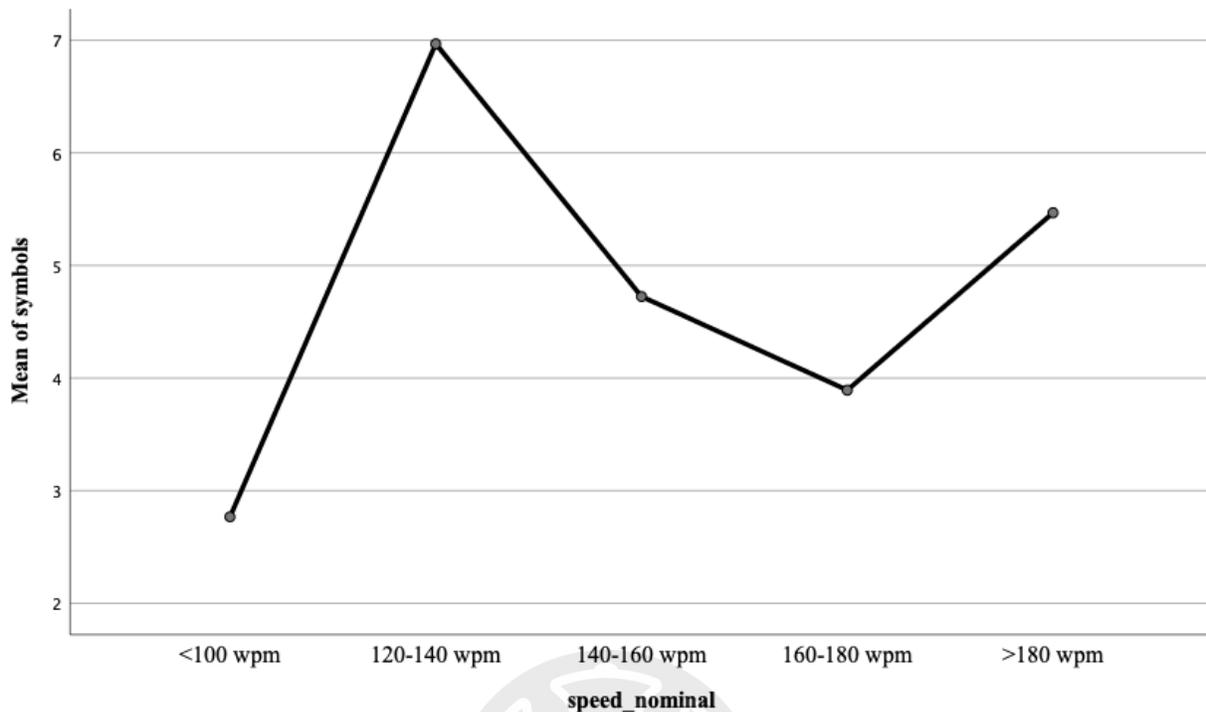Figure 5.5Mean of the use of language across Experiment 2 and Experiment 3

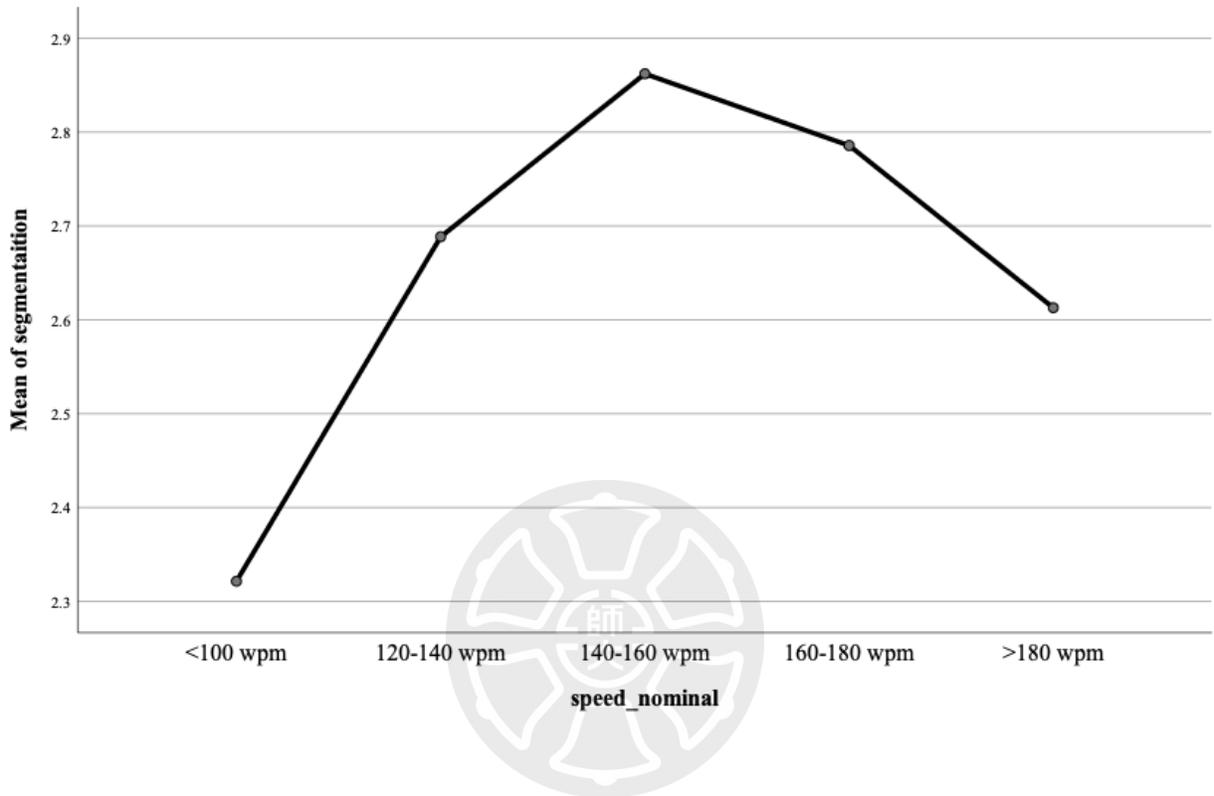Figure 5.6 Mean of the use of symbols across Experiment 2 and Experiment 3

Segmentation

When looking at the segmentation use of CI notes, there was no statistical significance between the different speech rate groups. Upon examining Figure 5.7, it can be seen that the 140-160 wpm group has the highest use of segmentation among all of the speech rate groups. In the post-test questionnaires, it was mentioned by the participants that the slower speech rates made it more difficult to recognize where a sentence ends, and where another starts. Perhaps this is the reason why during the <100 wpm, the participants did not utilize as much segmentation as the 140-160 wpm group.

Interestingly, as the speech rate increased from 140-160 wpm up to 160-180 wpm and >180 wpm, the segmentation usage also dropped. This could also be due to the speech rates

190

becoming too fast for the trainees to catch up on their CI notes to recognize the segments of the incoming message.

Figure 5.7 Mean of the use of segmentation between Experiment 2 and Experiment 3

Numbers

When looking at the numbers used of the CI notes, there was statistical significance between the different speech rate groups. While looking at Figure 5.8, it can be seen that the 120-140 wpm group has the most use of numbers; as the speed increased, the use of numbers also decreased instead, with a slight increase during the >180 wpm group. This result could indicate that at the slower speech rate group, numbers were easier to capture, and that the trainees were more capable of using numerical lists to help them structure their CI notes, hence the appearance of numbers inside their notes.

Figure 5.8 Mean of the use of numbers between Experiment 2 and Experiment 3

5.10 Post-test questionnaires

This section can be divided into two parts: the first post-test questionnaire that took place after Experiment 1, and the second post-test questionnaire that was administered after Experiment 2.

In both the questionnaires, the participants were asked if the speech rates played a role in their perception of the difficulty of the CI task. The majority of the answers from the two questionnaires leaned toward confirming on the impact of speech rate. When asked about how the speech rates influenced their note-taking process, in the Experiment 1 post-test questionnaire, the trainees did not quite commit to the idea that slower speech rate would necessarily help them in recalling the content. Some even answered that the slower speech rate would make the

"segment become too loose with a lack of focus and filled with too many details". Whereas in the Experiment 3 post-test questionnaire, the trainees more readily agree that the slower speech rate would help them in the note-taking process and recalling the speech content.

When asked if the slower speech rates helped in the listening and comprehension process, the Experiment 1 post-test questionnaire had answers where some trainees again emphasized that too slow of a speech rate would impede the comprehension process, whereas in the Experiment 3 post-test questionnaire, the trainees were more leaning toward the positive effect of slower speech rate helping in the comprehension process. The majority of trainees in both questionnaires did tend to agree that slower speech rate was a more ideal option be it in comprehension, recall, or note-taking. But there is still a slight difference in numbers of responses between the two questionnaires regarding their perception of slower speech rates. Experiment 1 post-test questionnaires fielded responses that reported slower speed rates do help, but some feel that speech rate being "too slow" would be obstructive. Experiment 3 post-test questionnaire responded that slower speech rate can help in overall CI task. When comparing the materials used in Experiment 1 and Experiment 3, it can be seen that the speech rates in these separate experiments were also vastly different. In Experiment 1, the speech rates ranged from 142.5 wpm, 81.8 wpm, 121 wpm, and 74.7 wpm; in Experiment 3, the speech rates ranged from 200 wpm, 127 wpm, 181.1 wpm, and 134 wpm. The responses that agreed to slower speech rates being helpful tend to fall in the Experiment 3 post-test questionnaire results.

5.11 General discussion

The effect of slower speech rate does happen during the training stages of CI. In past studies, Setton and Dawrant (2016), Gile (2001) mentioned adopting gradual approach of increasing the speech rate of the materials used in training. More specifically, past research

studies believed that the differentiation of the speech rate in the materials used itself can be helpful in determining the training progress for the trainees (such as the SDI provided by Setton & Dawrant, 2016). Such notion was provided as prescriptive studies in the past, with little or no empirical evidence to prove the validity of the assumption or recommendation. This research study was conducted with the hope of filling in this gap. Results showed that the relationship between speech rate and error rate does have moderate statistical significance; from the error type analysis it was also seen that the faster speech rates encountered more omission of segment type of error.

Upon examining the performance of trainees' output, present result showed that the slowest speech rate, which was the 100 wpm, did not necessarily yield the best performance, it was the 120-140 wpm that garnered the best result. This is similar to Chiu (2017)'s findings, where their SI trainees also did not perform better at 100 wpm when compared with 130 wpm results. Chiu stated that this could be due to memory capacity deficiency. The current study focused on CI, not on SI, however, the post-test questionnaire items did reveal similar sentiments stating that too slow a speech rate would lead to loss of memory of previous speech items, etc. Even though there is a world of difference between the working process of CI and SI, the issue of memory load seemed to be rather similar, but more research is needed to confirm.

When it came to CI notes, the trainees tend to choose TL when they were afforded with enough effort resources, but will fall back on SL when the speech rate gets too fast. Such observation is consistent with Tai (2020)'s result as well, where the participants also chose SL when encountering faster speech rate.

5.12 Implications for interpreting studies and interpreting training

The current study examined the speech rates used across three experiments during their semester-long training for CI. The three experiments also took place during three different phases of the trainees' CI semester-long course. There are two major findings in the current study that corresponded to the research questions posed: the first is that the most ideal speech range among the 12 different speech rates collected in this study would be the 120-140 wpm. Present study has shown that the trainees performed their CI task best during the 120-140 wpm, and wsa able to utilize the CI note-taking skills better. This result corroborated with past anecdotal suggestions by Seleskovitch (1968), where they mentioned that the ideal speech rate for SI is 120 wpm. Except present study presented empirical results for the Mandarin (A) and English (B) combination CI trainees. This finding can be easily replicated by using the MacOS FinalCut Pro or other similar editing software to ensure the materials used to be controlled or manipulated by the trainer at a certain speech rate.

Another noteworthy finding is that when the speech rate gets faster from 160-180 wpm and even at 180 wpm or beyond, it can be seen from trainees' CI notes as well as CI output that there was more omission of segment errors. When trainees commit omission of segment errors, it would be less likely for the trainers to decode the difficulties that the trainees may have encountered during that specific segment. This finding is of importance from a pedagogical standpoint, since trainers will have to plan out and prepare materials for trainees, when considering choosing speech texts for trainees at a undergraduate level, it is perhaps more ideal to avoid choosing materials that are above 180 wpm.

Given the present study adopted a relative easter approach to manipulate the materials, by means of using MacOS software FinalCut Pro, it is assumed that the result of the present study

can be easily replicated in the classroom. Beyond the ease of control for selecting materials, the results of students' performance should also be easier to examine whether the materials being used were at an ideal speech rate, i.e., the omission of segments error rate, i.e, were there too many omission of segment errors, the materials were probably too fast for the trainees to handle.

5.13 Limitations of the study and suggestions for future research

The present study focused on the observation of the speech rates and its relationship with error rates. However, since the focus was on the speech rate itself, the materials being used were not being fully controlled and may resulted in a discrepancy between the level of difficulty of the texts used in the experiments. This discrepancy may have contributed to the slower speech rate segments in Experiment 1 and Experiment 2 not fully reflected in having a positive effect in assisting the trainees perform better in CI. In the future, further studies may consider adopting similar speeches with controlled level of textual difficulty in order to achieve a positive effect in using slower speech rate materials for training purposes as well as research studies.

When it comes to future studies, it may be worthwhile looking into the different direction of the CI process, in particular, performing task from Mandarin (A) to English (B), and examine if the speech rates would provide a similar effect to the results of the present study, with the direction going from English (B) to Mandarin (A).

5.14 Conclusion

The present study wishes to explore the effect of slower speech rate materials and its impact on CI trainees, as well as their CI notes. In order to find out the effect of the slower speech rate materials, three experiments were conducted on two groups of undergraduate students. The error average showed that there was a positive impact of slower speed during the slow_1 segments of

the experiments. The correlation coefficient result showed that there is only a moderate effect in regards to the slower speech rate and its impact on error rate. As previously mentioned, the moderate effect could be due to the fact that the trainees were still getting used to the training process during Experiment 1 and 2. One-way ANOVA analyses were conducted to examine the speech rate and error rate, the experiment and error rate, speech rate and error category, and the speech rate and CI notes. Results showed that the speech rate did have a statistical significance on the error rate, so did the experiments themselves. The speech rate and error category also reached statistically significant result. As for the last section of the analysis, which is the speech rate and CI notes, it was found that the both SL and TL has statistically significant result. Trainees were more able to take down notes in TL during the 120-140 wpm group (E1 original_2, 121 wpm; E3 slow_1, 127 wpm; E3 slow_2, 134 wpm), which is predominantly made up of slower speech rate segments from Experiment 3. Trainees tended to rely on SL the most during the 140-160 wpm group (E1 original_1, 142.5 wpm; E2 original_1, 149.5 wpm; E2 original_2, 160.3 wpm), which also corresponded to the assumption that trainees were still trying to get used to the CI training process during Experiment 1 and 2. Trainees were also able to take down more notes whether in full-word or abbreviation during the 120-140 wpm group, with the 120-140 wpm group being the best performing group of all. In general, the trainees seemed to be able to simply just take down more notes during the 120-140 wpm groups, with more usage of symbols and TL, presumably indicting a smoother processing procedure during this particular speech rate group. During the post-test questionnaire, it was also mentioned after Experiment 3 that slower speech rate has made a difference in assisting the trainees process incoming message and recalling the noted info.

The results of this study showed that the slower speech rate segments did have a positive impact on the trainees, specifically upon encountering the slower speech rate for the first time during the experiment. However, the two groups of trainees from this study have a language combination of Mandarin (A) and English (B), hence it remains to be seen whether the result will be the same with trainees of other language combinations. The purpose of the current research is to understand the effect of slower speech rate and its impact on interpreter trainees, as well as its pedagogical implications for training purposes. Further exploration is needed for more relevant discussion on the impact of slower speech rate and its impact.

References

Albl-Mikasa, M. (2008). (Non-)Sense in note-taking for consecutive interpreting. *Interpreting. International Journal of Research and Practice in Interpreting*, *10*(2), 197-231.

Alexieva, B. (1994). On teaching note-taking in consecutive interpreting Teaching Translation and Interpreting 2. In (p. 199). John Benjamins.

Barghout, Rosendo, L. R., & García, M. V. (2015). The influence of speed on omissions in simultaneous interpretation. *Babel*, *61*(3), 305-334.

Bowen, D., & Bowen, M. (1985). The Nuremberg Trials: Communication through translation. *Meta*, *30*(1), 74.

Bühler, H. (1986). Linguistic (semantic) and extra-linguistic (pragmatic) criteria for the evaluation of conference interpretation and interpreters. *Multilingua*, *5*(4), 231-235.

Chang, C.-c. (2005). Directionality in Chinese/English Simultaneous Interpreting: Impact on performance and strategy use. Unpublished dissertation. The University of Texas at Austin.

Chang, C.-c., & Wu, M.-c. (2014). Non-native English at international conferences: Perspectives from Chinese--English conference interpreters in Taiwan. *Interpreting*, *16*(2), 169-190.

Chen, S. (2016). Note-taking in consecutive interpreting: A review with special focus on Chinese and English literature. The Journal of Specialized Translation, 151-171.

Chen, S. (2017). Note-taking in consecutive interpreting: New data from pen recording. The International Journal of Translation and Interpreting Research, 9(1),

Chiu, Y.-H. (2017). The effects of input rate on the output of simultaneous interpreting from English into Chinese. Unpublished doctoral dissertation. National Taiwan Original University.

Chuang, L.-l. (2008). Note-taking Know-how: A Processing Perspective on Consecutive

    Interpreting. *SPECTRUM: NCUE Studies in Language, Literature, Translation*, *2*, 93-

    101.

Class, B., Moser-Mercer, B., & Seeber, K. (2004). Blended learning for training interpreter

    trainers. In D. Remenyi (Ed.), (pp. 507-515). Academic Conferences Limited.

Craik, F. I. M., & Lockhart, R. S. (1972). Levels of processing: A framework for memory

    research. *Journal of Verbal Learning and Verbal Behavior*, *11*(6), 671-684.

Dam, H. V. (2004a). Interpreters' notes: On the choice of language. *Interpreting*, *6*(1), 3-17.

Dam, H. V. (2004b). Interpreters' notes: On the choice of form and language. In K. M. O. D. G.

    Gyde Hansen (Ed.), Claims, Changes and Challenges in Translation Studies (pp. pp. 251-

    261). John Benjamins Publishing Company.

de Raadt, A., Warrens, M. J., Bosker, R. J., & Kiers, H. A. L. (2021). A Comparison of

    Reliability Coefficients for Ordinal Rating Scales. *Journal of Classification*, *38*(3), 519–

    543.

Gerver, D. (1969). The effects of source language rate on the performance of simultaneous

    conference interpretation. Proceeding on the Second Louisville Conference on Rate and

    Frequency-Controlled Speech Kentucky: Center for Rate-Controlled Recordings,

    University of Louisville., 162-184.

Gerver, D. (1976). Empirical Studies of Simultaneous Interpretation: A Review and a Model. In

    R. W. Brislin; (Ed.), Translation Applications and Research. Gardener Press.

Gile, D. (2006). Conference Interpreting. In K. Brown (Ed.), *Encyclopedia of Language &*

    Linguistics (pp. 9-23). Elsevier.

Gile, D. (1991). The processing capacity issue in conference interpretation. *Babel*, *37*(1), 15-27.

Gile, D. (1999a). Testing the Effort Models' tightrope hypothesis in simultaneous interpreting -
A contribution. *Hermes*, *12*(23), 153.

Gile, D. (1999b). Use and misuse of the literature in interpreting research. *The Interpreters'*
Newsletter, 929-43.

Gile, D. (1999c). Variability in the perception of fidelity in simultaneous interpretation. *Hermes*,
22, 51-79.

Gile, D. (2001a). Consecutive vs. Simultaneous: Which is more accurate? Interpretation Studies,
No. 1), 8-20.

Gile, D. (2001b). The role of consecutive in interpreter training: A cognitive view. AIIC.
Communicate, 14.

Gile, D. (2006). Conference interpreting. In K. Brown (Ed.), *Encyclopedia of Language and*
Linguistics (pp. 9–23). Elsevier.

Gile, D. (2009). Basic concepts and models for interpreter and translator training (Rev. ed.). John
Benjamins Publishing Company.

González, M. A. (2012). The language of consecutive interpreters' notes: Differences across
levels of expertise. *Interpreting*, *14*(1), 55-72.

Gran, L. (1998). In-training development of interpreting strategies and creativity Translators'
strategies and creativity. In (p. 145). John Benjamins.

Harvey, N. D. (2021). *A simple guide to inter-rater, intra-rater and test-retest reliability for*
animal behaviour studies.

Herbert, J. (1952). The Interpreter's Handbook: How to become a conference interpreter.
Genève: Librairie de l'Université.

Ilg, G., & Lambert, S. (1996). Teaching consecutive interpreting. *Interpreting*, *1*(1), 69-95.

Korpal, P. (2012). Omission in simultaneous interpreting as a deliberate act. Translation research projects 4, pp. 103-111.

Kurz, I. (1992). 'Shadowing' exercises in interpreter training. In Teaching Translation and Interpreting (p. 245). John Benjamins Publishing Company.

Kurz, I. (1993). Conference interpretation: Expectations of different user groups. *The Interpreters' Newsletter*, 513-21.

Liu. (2008). 逐步口譯與筆記: 理論, 實踐與教學

Liu, & Chiu. (2009). Assessing source material difficulty for consecutive interpreting: Quantifiable measures and holistic judgment. *Interpreting*, *11*(2), 244-266.

Liu, M. (1994). Transition from preparatory exercises to consecutive interpretation: Principles and techniques. *Fu Jen Studies*, *27*, 104-116.

Liu, M., Chang, C.-c., & Wu, S.-c. (2008). Interpretation evaluation practices: Comparison of eleven schools in Taiwan, China, Britain, and the USA (in Chinese). 11-42.

Mackintosh, J. (1995). A Review of Conference Interpretation: Practice and Training. *Target*, *7*(1), 119-133.

Massaro, D. W., & Shlesinger, M. (1997). Information processing and a computational approach to the study of simultaneous interpretation. *Interpreting*, *2*(1-2), 13-53.

Meuleman, C., & Van Besien, F. (2009). Coping with extreme speech conditions in simultaneous interpreting. *Interpreting*, *11*(1), 20-34.

Neff, J. (2011). A statistical portrait 2005-2009. https://aiic.net/page/3585/a-statistical-portrait-2005-2009/lang/1

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

Plevoets, K., & Defrancq, B. (2018). The cognitive load of interpreters in the European Parliament. *Interpreting*, *20*(1), 1-32.

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

Pöchhacker, F. (2016). *Introducing Interpreting Studies 2nd ed*. Routledge.

Ribas, M. (2012). Problems and strategies in consecutive interpreting: A pilot study at two different stages of interpreter training. Meta, 57(3), 812-835.

Rosendo, L. R., & Galván, M. C. (2019). Coping with speed: An experimental study on expert and novice interpreter performance in the simultaneous interpreting of scientific. Babel, 65(1), 1-25.

Rozan, J. F., & Hrehorowicz, U. (1956). Note-taking in consecutive interpreting. Cracow Tertium Society for the Promotion of Language Studies.

Sawyer, D. B. (2004). Fundamental Aspects of Interpreter Education: Curriculum and Assessment. John Benjamins Publishing Company.

Seleskovitch, D. (1989). Teaching conference interpreting. Translator and interpreter training and foreign language pedagogy, 65-88.

Seleskovitch, D., & Lederer, M. (1995). A systematic approach to teaching interpretation. Registry of Interpreters for the Deaf.

Setton, R., & Dawrant, A. (2016). Conference interpreting: a trainer's guide ((121)). John Benjamins Publishing Company.

Shlesinger, M. (2003). Effects of presentation rate on working memory in simultaneous interpreting. The Interpreters' Newsletter, 1237-49.

Szabó, C. (2006). Language choice in note-taking for consecutive interpreting. Interpreting, 8(2),

Szabó, C. (2021). Revisiting Consecutive Note-Taking: What, How, and in What Language. ELOPE: English Language Overseas Perspectives and Enquiries, 18(1), 107-124.

Tai, Y.-a. (2020). The impact of fast speech rate on note-taking and accuracy in E-C consecutive interpreting. Unpublished master's thesis. National Taiwan Original University

Vančura, A. (2013). The story of the tortoise and the hare – Speech rate in simultaneous interpretation and its influence on the quality of trainee-interpreters performance. Jezikoslovlje, 14(1), 85-99.

Washbourne, K., & Gillies, A. (2017). Note-taking for consecutive interpreting: A short course. Routledge.

Weber, W. K. (1984). Training translators and conference interpreters. Language in Education: Theory and Practice, 58

Weber, W. K. (1989). Improved Ways of Teaching Consecutive Interpretation. Theoretical and Practical Aspects of Teaching Conference Interpreting, 161-166.

Wilson, D., & Sperber, D. (2002). Relevance theory. Blackwell.

Wu, S. (2013). How do we assess students in the interpreting examinations? In D. Tsagari, Deemter, R. (Ed.), Assessment issues in language translation and interpreting (Vol. 29, pp. 15-33). Peter Lang GmbH.

Li, J. M. (1996). 汝明麗《從使用者觀點探討口譯品質與口譯員之角色》，未出版之碩士論文，輔仁大學

Appendix A

Experiment 1 speech transcript, Emma Watson

Today we are launching a campaign called "HeForShe." I am reaching out to you because I need your help. We want to end gender inequality—and to do that we need everyone to be involved. This is the first campaign of its kind at the UN: we want to try and galvanize as many men and boys as possible to be advocates for change. And we don't just want to talk about it, we want to try and make sure that it's tangible. I was appointed as Goodwill Ambassador for UN Women six months ago

and the more I have spoken about feminism the more I have realized that fighting for women's rights has too often become synonymous with man-hating. If there is one thing I know for certain, it is that this has to stop. For the record, feminism by definition is: "The belief that men and women should have equal rights and opportunities. It is the theory of the political, economic and social equality of the sexes."

I started questioning gender-based assumptions a long time ago. When at eight I was confused at being called "bossy," because I wanted to direct the plays that we would put on for our parents—but the boys were not. When at 14 I started to be sexualized by certain elements of the press. When at 15 my girlfriends started dropping out of their beloved sports teams because they didn't want to appear "muscly. "When at 18 my male friends were unable to express their feelings. I decided that I was a feminist and this seemed uncomplicated to me. But my recent research has shown me that feminism has become an unpopular word. Women are choosing not to identify as feminists.

Apparently, I am among the ranks of women whose expressions are seen as too strong, too aggressive, isolating, and anti-men, unattractive, even. Why has the word become such an uncomfortable one?

I am from Britain and I think it is right that I am paid the same as my male counterparts. I think it is right that I should be able to make decisions about my own body. I think it is right that women be involved on my behalf in the policies and decision that will affect my life.

Experiment 2 speech transcript, Michelle Obama

My dad was our rock. Although he was diagnosed with multiple sclerosis in his early 30s, he was our provider, our champion, our hero. As he got sicker, it got harder for him to walk, it took him longer to get dressed in the morning. But if he was in pain, he never let on. He never stopped smiling and laughing — even while struggling to button his shirt, even while using two canes to get himself across the room to give my mom a kiss. He just woke up a little earlier and worked a little harder. He and my mom poured everything they had into me and Craig. It was the greatest gift a child can receive: never doubting for a single minute that you're loved, and cherished, and have a place in this world. And thanks to their faith and hard work, we both were able to go on to college. So I know firsthand from their lives — and mine — that the American dream endures.

The people gathered together that day were ordinary folks doing the best they could to build a good life. They were parents trying to get by paycheck to paycheck; grandparents trying to get by on a fixed income; men frustrated that they couldn't support their families after their jobs have disappeared. Those folks weren't asking for a handout or a shortcut. They were ready to work — they wanted to contribute. They believed — like you and I believe — that America

should be a place where you can make it if you try. Barack stood up that day, and he spoke words that have stayed with me ever since.

He talked about "The world as it is" and "The world as it should be." And he said that all too often, we accept the distance between the two, and settle for the world as it is — even when it doesn't reflect our values and aspirations. But he reminded us that we also know what our world should look like. He said we know what fairness and justice and opportunity look like. And he urged us to believe in ourselves — to find the strength within ourselves to strive for the world as it should be. And isn't that the great American story? It's the story of men and women gathered in churches and union halls, in town squares and high school gyms — people who stood up and marched and risked everything they had — refusing to settle, determined to mold our future into the shape of our ideals.

It is because of their will and determination that this week, we celebrate two anniversaries: the 88th anniversary of women winning the right to vote, and the 45th anniversary of that hot summer day when Dr. Martin Luther King Jr. lifted our sights and our hearts with his dream for our nation. I stand here today at the crosscurrents of that history — knowing that my piece of the American dream is a blessing hard won by those who came before me. All of them driven by the same conviction that drove my dad to get up an hour early each day to painstakingly dress himself for work.

Experiment 3 speech transcript, Sheryl Sandberg

So the question is, how are we going to fix this? How do we change these numbers at the top? How do we make this different? I want to start out by saying, I talk about this -about keeping women in the workforce -- because I really think that's the answer. In the high-income part of our workforce, in the people who end up at the top -- Fortune 500 CEO jobs, or the equivalent in other industries -- the problem, I am convinced, is that women are dropping out. Now people talk about this a lot, and they talk about things like flextime and mentoring and programs companies should have to train women. I want to talk about none of that today, even though that's all really important. Today I want to focus on what we can do as individuals. What are the messages we need to tell ourselves? What are the messages we tell the women that work with and for us? What are the messages we tell our daughters?

Now, at the outset, I want to be very clear that this speech comes with no judgments. I don't have the right answer. I don't even have it for myself. I left San Francisco, where I live, on Monday, and I was getting on the plane for this conference. And my daughter, who's three, when I dropped her off at preschool, did that whole hugging-the-leg, crying, "Mommy, don't get on the plane" thing. This is hard. I feel guilty sometimes. I know no women, whether they're at home or whether they're in the workforce, who don't feel that sometimes. So I'm not saying that staying in the workforce is the right thing for everyone. My talk today is about what the messages are if you do want to stay in the workforce, and I think there are three. One, sit at the table. Two, make your partner a real partner. And three, don't leave before you leave.

If you ask women why they did a good job, what they'll say is someone helped them, they got lucky, they worked really hard. Why does this matter? Boy, it matters a lot. Because no one gets to the corner office by sitting on the side, not at the table, and no one gets the promotion if they

don't think they deserve their success, or they don't even understand their own success. I wish the answer were easy. I wish I could go tell all the young women I work for, these fabulous women, "Believe in yourself and negotiate for yourself. Own your own success." I wish I could tell that to my daughter. But it's not that simple. Because what the data shows, above all else, is one thing, which is that success and likeability are positively correlated for men and negatively correlated for women. And everyone's nodding, because we all know this to be true.

My generation really, sadly, is not going to change the numbers at the top. They're just not moving. We are not going to get to where 50 percent of the population -- in my generation, there will not be 50 percent of [women] at the top of any industry. But I'm hopeful that future generations can. I think a world where half of our countries and our companies were run by women, would be a better world. It's not just because people would know where the women's bathrooms are, even though that would be very helpful. I think it would be a better world. I have two children. I have a five-year-old son and a two-year-old daughter. I want my son to have a choice to contribute fully in the workforce or at home, and I want my daughter to have the choice to not just succeed, but to be liked for her accomplishments. Thank you.

Appendix B

Consent form

各位同學好：

我是師大翻譯所的博士生，目前正在研究口譯學生的筆記及口譯產出，未來希望將研究所得運用在口譯教學上，幫助學生學習口譯。正好Angy老師曾經教授各位同學逐步口譯技巧及筆記方法，因此希望如果可以的話，占用各位一點時間，邀請各位參與我的實驗前測。過程中，我會播放一段影片，請同學透過**筆記**進行**逐步口譯**並且全程錄音，錄下自己的口譯內容。我也會提出一些簡單的訪談問題，同學的回饋將會是非常寶貴的研究材料，結束時如果各位有任何針對口譯的問題，我也會盡力解答。

演講總共長度為4分鐘，全程所需時間大約為一小時，非常感謝各位的幫忙。前測執行的前一刻我會發下受試者同意書，再請各位填答簽名，感謝各位同學！

楊蕾敬上

（四)研究參與者知情同意書

計畫名稱： 逐步口譯與速度

研究機構名稱：師大翻譯所

經費來源：無

計畫主持人：楊蕾　　　　職稱：

共(協)同主持人：　　　　職稱：

※研究計畫聯絡人：　　　　　電話：

---

1. 研究背景與目的：
　　了解學生學習逐步口譯。

---

2. 研究方法及程序：
　　請學生進行逐步口譯，填答相關問卷。研究將參考學生的逐步口譯內容產出，以及所記錄的逐步口譯筆記。

---

3. 可能產生之副作用、危險及處理方法：
　　如果受試者在實驗進行期間產生任何身體不適症狀，或是發生突發危險，例如：天災，將中止實驗，確保受試者平安。

---

4. 研究預期效果與對研究參與者的益處：
　　研究結果將運用在未來口譯教學領域，有助學生學習逐步口譯。

5. 參與研究的條件，及研究進行中的禁忌或限制活動：

請受試者注意此研究著重在「逐步口譯」，因此需請受試者準備進行逐步口譯的相關文具，例如習慣使用的逐步口譯筆記本，以及紙筆等等。

6. 研究材料保存期限、運用規劃及機密性：

(1). 研究資料使用地點：僅於國內使用。

(2). 研究資料性質、保存人員、保存地點、保護方式：錄音檔及問卷、研究人、加密檔案夾、加密形式保存。

(3). 保存期限：本研究將保存您的資料最多 20 年，直至（2048 年/03 月/02 日）為止。屆期將以銷毀處理。

(4). 機密性：研究計畫主持人將依法把任何可辨識您身分之紀錄與您個人隱私之資料視同機密處理。將來發表研究結果時，您的身份將被充分保密。凡簽署了知情同意書，即表示您同意各項原始紀錄可直接受監測者、稽核者、研究倫理委員會及主管機關檢閱，以確保研究過程與數據，符合相關法律和各種規範要求；上述人員承諾維繫您身分之機密性。

7. 研究之退出與中止：

您可決定是否參加本研究，研究過程中您可隨時撤銷同意，退出研究，不須任何理由。若您決定撤回同意，可與計畫主持人或聯絡人聯繫，以利協助您退出研究。您也已充份了解計畫主持人、經費來源單位，或研究計畫監督單位亦可能於必要時中止本研究進行。

8. 損害補償或保險：

本研究依計畫執行，若因參與本研究而發生不良事件或損害，將由（研究者楊蕾）以（金錢）方式作為補償。除前述之補償原因與方式外，本研究不提供其他形式之補償。

本研究並未安排保險。但您簽署本知情同意書後，在法律上的權利不會因此受影響。

9. 參與者權利：

1) 研究計畫主持人或研究人員已經妥善地向您說明了研究內容與相關資訊，並告知可能影響您參與研究意願的所有資訊。

2) 若您有任何疑問，可向研究人員詢問，研究人員將據實回答。

3) 研究計畫主持人已將您簽署之一式兩份同意書其中一份交給您留存。

4) 如果您因參與本研究而感到權益受損或受到傷害，請與國立臺灣師範大學研究倫理審查委員會聯絡（電話：(02)7734-1394、(02)7734-1395 或 電子郵件信箱：ntnurec@gmail.com ）。

10.聲明及簽名：

研究者聲明

我本人或我研究團隊中的一位成員（已獲授權者），已對研究參與者解釋過本研究，包括本研究的目的、方法與參加本研究可能的相關危險性和效益等。參與者所提出之疑問，均已予以答覆。

解釋同意書之研究人員（正楷）_____（簽字）
日期_____

計畫主持人姓名（正楷）_____（簽字）
日期_____

參與者聲明

我已了解以上的資訊且同意參與此項研究計畫。

參與者姓名簽名（正楷）_____（簽字）
日期_____

法定代理人姓名簽名（正楷）_____（簽字）
日期_____

若您不是參與者或其法定代理人，但因實際需要，參與者或其法定代理人（暫時）無法簽署本同意書而需由您代簽。請用正楷書寫您的姓名，並寫出您與參與者的關係：

姓名簽名（正楷）_____（簽字）　　日期_____

關係_____(有同意權之人為配偶或同居之親屬) 身份證字號

通訊地址_____　　聯絡電話

口頭同意之見證

(參與者無法閱讀上述內容時，而經由研究人員口述說明，需有另一見證人在場)

茲證明本計畫主持人及研究人員已完整地向參與者解釋研究的內容。

見證人姓名簽名（正楷）_____（簽字）日期_____

關係 _____ (有同意權之人為配偶或同居之親屬)身份證字號

通訊地址 _____聯絡電話

Appendix C

Post-test Questionnaire 1st Experiment

研究前測問卷調查

同學您好：

感謝您願意參加本次研究。本問卷包含兩大部份，第一部份是個人背景問卷，目的為了解先前英語學習經驗；第二部份是逐步口譯學習問卷，目的為了解您逐步口譯的學習經驗。本卷所有內容皆不記分，也沒有所謂的正確答案，請仔細閱讀題目並據實作答。非常感謝您的協助。

所有個人相關資料皆做為本研究者前測使用，所有個資皆一率保密，永不外流。

一、個人背景

就讀學校：_____，目前級別：_____。

年齡：_____

性別：□ 男 □女　英語學習年齡：_____年/ 國外居住經驗：□ 有（_____年，_____國家）

全民英檢考試：□ 有（_____級通過）、多益 TOEIC 考試：□ 有（_____分）、

托福英語能力測驗：□ 有（_____分）、

其他英文能力檢定考試：_____，_____分。

二，逐步口譯學習經驗：

1. 請問您學習逐步口譯多久，總計學習過幾個學期？

答：＿＿＿＿＿＿＿＿ 學期。

2. 請問您過去每週練習逐步口譯的時數多少（課堂練習也可計算在內）？

答：＿＿＿＿＿＿＿＿小時。

3. 請問您在課堂以外，是否曾經有過逐步口譯的經驗？如果有的話，請問時數大約多少？

答：＿＿＿＿＿＿＿＿ 小時。

4. 針對逐步口譯而言，請問您認為講者的「語速」、「速度」是否為重要關鍵？
答：
　　　□是　　　　□否

5. 剛剛的演講當中，總共有四段，請問你是否感覺到有一些段落速度比較慢？如果有的話，請問是哪幾段速度較慢？
答：

6. 你覺得速度較慢對於你的影響為何？

答：

7. 速度較慢是否影響你理解講者，有幫助你更加理解，還是阻礙你理解內容？

答：

8. 速度較慢是否影響你做筆記，有幫助你記下筆記，事後回想更加順利，還是阻礙你順利記下筆記，事後無法順利回想筆記內容？

答：

9. 速度較慢是否影響你的口譯產出？有幫助你在做口譯時更加順利，還是阻礙你口譯無法順利完成？

答：

Post-test Questionnaire 3rd Experiment

研究問卷調查

同學您好：

感謝您願意參加本研究。本問卷的目的在於請教您對於實驗內容的經驗及想法。本卷所有內容皆不記分，也沒有所謂的正確答案，請仔細閱讀題目並據實作答。非常感謝您的協助。

所有個人相關資料皆做為本研究使用，所有個資皆一率保密，永不外流。

1. 請問您認為演講的內容是否容易理解？

2. 演講主題是否太過困難？如果有出現困難，可否描述困難的地方，例如語速、講者口音等等？

3. 您認為演講的四個片段中，是否有某些片段速度較慢，如果有，是哪幾個片段？

4. 您認為速度較慢是否能夠更加幫助理解？

5. 速度較慢是否能夠幫助您記下筆記？

6. 速度較慢是否有助於聽懂內容？

本份問卷到此結束，非常感謝您！