Smartphone-tapping VS Hand-writing: A Comparative Study of Note-taking Alternatives for Consecutive Interpretation

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Field of Study of Translation and Interpretation
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การศึกษาเปรียบเทียบเครื่องมือในการจดบันทึกในการล่ามพูดตาม ระหว่างการพิมพ์บน
โทรศัพท์มือถืออัจฉริยะและการเขียนด้วยมือ

นายภานุวัฒน์ โสใจวงค์

สารนิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาอักษรศาสตรมหาบัณฑิต
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Panuwat Sojaiwong : Smartphone-tapping VS Hand-writing: A Comparative Study of Note-taking Alternatives for Consecutive Interpretation. Advisor: Asst. Prof. NUNGHATAI RANGPONSUMRIT, Ph.D.

Tapping on a smartphone has expanded beyond texting, from interpersonal interaction to taking notes in an academic context. More specifically, consecutive interpreters, both novice and experienced, who are accustomed to smartphone tapping on a daily basis may be able to take notes on their smartphones. The study investigates the modern method of tapping on a smartphone as a note-taking alternative to the classic method of pen and paper. Six Thai interpreting students participated in a consecutive interpretation experiment. Participants were given the opportunity to practice both hand-writing and smartphone tapping for their consecutive interpretation tasks. The data was collected in the form of recorded audio files, speech transcripts, and virtual meeting recordings. The results were evaluated and discussed based on data extracted from self-assessment, interpretation fidelity assessment, and interview. The overall results suggest that smartphone notes can be reasonably practical. However, because of its novelty, extensive training is necessary, and it provides an optional alternative rather than a substitute for the traditional notes based on individual preference.

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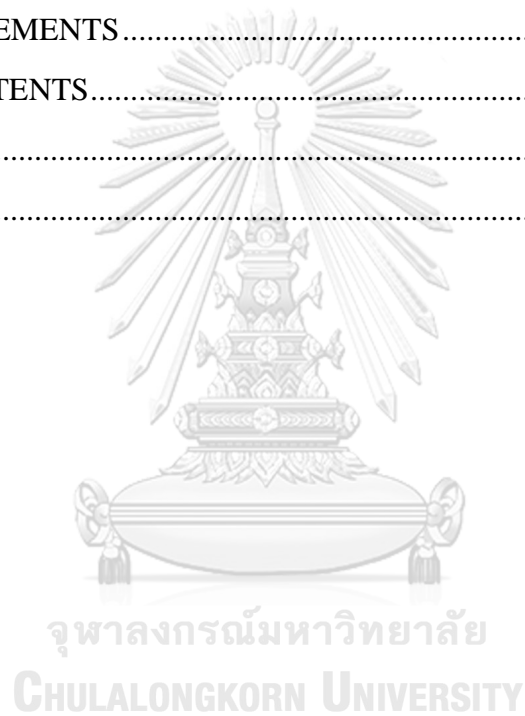
Abstract

Tapping on a smartphone has expanded beyond texting, from interpersonal interaction to taking notes in an academic context. More specifically, consecutive interpreters, both novice and experienced, who are accustomed to smartphone tapping on a daily basis may be able to take notes on their smartphones. The study investigates the modern method of tapping on a smartphone as a note-taking alternative to the classic method of pen and paper. Six Thai interpreting students participated in a consecutive interpretation experiment. Participants were given the opportunity to practice both hand-writing and smartphone tapping for their consecutive interpretation tasks. The data was collected in the form of recorded audio files, speech transcripts, and virtual meeting recordings. The results were evaluated and discussed based on data extracted from self-assessment, interpretation fidelity assessment, and interview. The overall results suggest that smartphone notes can be reasonably practical. However, because of its novelty, extensive training is necessary, and it provides an optional alternative rather than a substitute for the traditional notes based on individual preference.

Keywords: Consecutive interpretation, note-taking, Tapping on smartphone, Handwriting

Introduction

Note-taking has long been an inseparable part of the consecutive interpretation (CI) processes, as notes enable the interpreter to recall what has been said when reformulating their rendering. According to Pham Hong Hanh (2006), when consecutive interpretation is required for speeches lasting over two or three minutes, note-taking is of the essence. Taken notes act as a significant portion of consecutive mode, i.e., notes help novices and professionals follow along with the heard discourses no matter how long or complicated they are, according to Kellett (2016). Furthermore, Ferdowsi (2015) asserts that significant benefits of note-taking in CI include an improved analytical comprehension of source-text utterances, a reduced cognitive burden for the interpreter, and improved letter-oriented details.

Presently, however, tapping on a smartphone as a means to note has exceedingly become common among students, especially those familiar with university lectures, and it has been replacing the traditional approach of using pen and paper. Lee suggested in his research that the change of writing medium gives concrete results on students' written production, i.e., "that students tend to write significantly less on a mobile device compared to traditional pen-and-paper."(2020). In the same fashion, Schoen concluded in his study that typing notes could present a more effective method of influencing "memory retention" compared to handwriting in the lecture context, probably due to the interaction between note-taking and the learning environment (2012). Apart from that, according to the note-taking principles suggested by Kohn and Albl-Mikasa (2002), one of the principles refers to 'Individuality,' i.e. 'note-taking is not governed by any obligatory rules or regulations.' In simpler words, variables of note-taking are subjectively chosen among different people as long as they find them functional (p.258). As a result, having many alternatives for taking notes would have more advantages than downsides, mainly presenting smartphones as an available modern resource for note-taking in this paper.

Despite this, there remain several challenges associated with CI note-taking in general. Notes that are disorganized or inadequate can have unthinkable consequences. Typical issues with conventional note-taking using pen and paper for CI include picking the incorrect information to record, writing complete sentences or lengthy words instead of abbreviating, simplifying, or utilizing symbols, and, lastly, scribbling too quickly resulting in illegible handwriting. Therefore, it is arguable whether tapping smartphones can tackle the mentioned issues.

As a result, regardless of a series of studies that have widely discussed a spectrum of aspects of the traditional way of note-taking for CI, including its principles and problems, there is no specific research on tapping on a smartphone as an alternative for hand-wiring, when taking notes for CI. Given the aforementioned, the purpose of this study was to investigate the advantages of smartphone tapping for CI note-taking in comparison with the traditional method of handwriting.

Methodology

An experiment was carried out with six recruited participants of the same level of general knowledge of consecutive interpretation: Thai interpreting students who are used to tapping on a smartphone on a daily basis for over ten years. Furthermore, both note-taking varieties need to be experimented with and recorded to account for the parallel comparison.

Participants

In this exploratory study, six volunteers between the ages of 22 and 30 were recruited. Henceforth, each participant will be referred to as "Participant1" through "Participant6," and their order will be maintained until the end of the article. Every participant was familiar with smartphone tapping in their daily lives or an academic setting. They are all language interpreting students, both undergraduate and graduate levels, and were thus well aware of the distinct characteristics of consecutive interpreting. Furthermore, they shared working languages: Thai as an A language and English as a B language. When taking notes on smartphones, every participant can determine whether to use "word-prediction" features according to their preference. In addition, during the experiment, participants must be able to assess themselves, consulting provided self-assessment criteria, and provide feedback on their performances. More crucially, given that the information provided was confidential, all participants were willing to offer their recorded audio interpreting rendition as a reference. Finally, all participants, previously informed and agreed-upon, were willing to offer their notes taken using both alternatives.

Pilot trial

As a pilot trial, tapping on a smartphone was practiced by the researcher himself to investigate the many characteristics and experiences the new alternative may present. To formulate a standard guideline for the smartphone note-taking and determine the use of word-prediction or auto-correction features, the researcher ran pilot note-taking activities using an iOS application, Notes. After selecting three

stimuli for the experiment in consultation with the project advisor, the researcher practiced taking notes on a smartphone and concluded with a brief guideline on how to take a practical smartphone note.

A brief guideline on taking notes by tapping on a smartphone includes the following.

1. Mainly abbreviate instead of typing complete words, phrases, or sentences.
2. Understand your abbreviation so that you can recall the material accurately.
3. Note in chronological order from the top down.
4. In the case of numbers, leave a space when going from hundreds to thousands, millions, or billions, e.g., 278 540 099 for 278,540,099.
5. Symbols like →, ↑, ↓, ≥, ↔ may not be easily accessible on the default keyboard. Do not squander your time.
6. Pay close attention to the links such as so, bc (because), x (excluding) etc.

Consecutive Interpreting Experiment with the Two Note-taking Alternatives

There were three consecutive interpretation tasks. Stimuli consisted of one Thai spoken speech and two English spoken speeches in the form of video clips that were meticulously selected based on a set of requirements to control for any variance and undesired influences.

Selection of the Source Texts

The two English speeches were derived from the same source speech but with different periods to retain the same level of difficulty and the talking speed. The topic of the English speech was "How Climate Change Could Make Our Food Less Nutritious," while the topic of the Thai speech was "Food Security." Each of the three selected clips lasts between 2.30 and 2.45 minutes. Furthermore, the researcher purposefully selected the Thai and English utterances of individuals whose speaking speed is average (100 to 130 words per minute). In addition, potentially problematic terms were supplied to participants in a random order two hours prior to the experiment (see Appendix A).

The Experiment Session

Three note-taking activities with both note-taking alternatives were conducted as an online meeting session having each participant join the Zoom meeting. Several Zoom meetings were arranged to accommodate each participant's availability. First, participants attended an orientation session to acknowledge the forthcoming procedure, specific regulations, and a brief note-taking guideline for smartphones. Participants were then assigned as interpreters and were instructed to perform a CI after watching each of the three pre-selected video clips. The first video clip was for an English-Thai CI's handwriting note trial, while the second and third clips were for smartphone-tapping note trials. Regarding the two video clips for smartphone notes, one source text was in English for an English-Thai CI exercise, and the other was a Thai source text for a Thai-Thai note-taking and recalling activity. In this light, the purpose of the Thai-Thai note-taking and recalling exercise was to compare the effectiveness of the note taken without the influence of the interpreting burden. Well informed, participants recorded themselves while interpreting or retelling the speech, and submitted recorded renditions as audio files (.mp3, or m4a) to the researcher within three minutes after they had finished each task. Participants were monitored via Zoom with their cameras on to make sure they were not looking up a dictionary and they recorded each given task only once. Participants then submitted their notes taken with two different methods after they had finished each CI.

Self-assessment

The researcher then provided the participants with a google form link to have them evaluate their interpretation and recalling performances; participants conducted three self-assessments for the three tasks and submitted them to the researcher. The participants were given a criterion and required to complete online assessment forms. Thus, the rated scores could be summarized following the score sheet in Table 1. The final score was subsequently computed by the researcher.

In regards to Lee's statistical analysis (2015), the content category should be allocated an effective weight of 2, while the other categories might be assigned a weighting value of 1. The Self-Assessment Form was modified accordingly. The

researcher assigned 2.5 and 2 weighting values to the "content categories," including the main idea and supporting ideas/elaborated examples, respectively (see Table 1).

Table 1: Self-Assessment Form

Consecutive Interpretation Eng-Th: title of the selected clip Note-taking method: …	
Final Score = collected score ÷ 3	final score ………x….……
Score 4 – excellent 3 – good 2 – average 1 – poor/ need improvement	
Main Idea (x2.5 weighting value)	x
Supporting Ideas and elaborated examples (x2 weighting value)	x
Coherence (x1 weighting value)	x
Language (x1 weighting value)	x
Delivery (x1 weighting value)	x

Interpretation Fidelity

The researcher graded each of the participant's three renditions based on "interpretation fidelity." All source text speeches and the participants' audio files were transcribed first using the Otter application and then proofread by the researcher for correction. As indicated in Table 2, each transcript was compared to its source text to shed light on mistranslation, omission, addition, and missing information/details, allowing the researcher to determine the degree of interpretation fidelity of the participants' renderings.

While the overall interpretation score is 10, the score deduction rubric is as follows: 1 point will be deducted for each mistranslation discovered, -0.5 for each omission – a skip of the idea either main or supporting, -0.5 for each addition, and -0.25 for each loss of minor detail detected e.g. numbers, examples, and reasons given in the source text.

Table 2: Interpretation Fidelity Assessment Form

Participants no.	Traditional Notes	Smartphone Notes	
		Eng-Th	Th-Th
Misinterpretation (-1)			
Omission (-0.5)			
Addition (-0.5)			
Loss of details (-0.25)			
Total score (10)			

The collected data will be further elaborated on in the discussion session.

Comprehensive Interview

Participants were required to remain in Zoom after completing a total of three CI exercises. The interview followed the questioning guideline indicated below with caution.

According to your performance, which approach do you prefer and why?

What are the benefits of handwritten notes, in your opinion?

What are the challenges of handwritten notes, in your opinion?

What are the benefits of smartphone-tapping notes, in your opinion?

What are the challenges of smartphone-tapping notes, in your opinion?

Do you have any suggestions or comments?

Results and Discussion

To compare the effectiveness of hand-writing with smartphone tapping for CI note taking, three sources of critical data were evaluated: the scores inferred from the self-assessment form (see Table 1), the interpretation fidelity assessed by the researcher (see Table 2), and the opinions given during the interview.

Data Inferred from the Self-Assessment Form

To begin with, each note-taker was instructed to fill out three assessment forms (Table 1): one for their rendition using traditional notes and the other two for their renditions using smartphone notes, abbreviated as 'SPN' in the diagrams due to space limitation. The marks entered into each blank on the assessment form will be summarized to create a total score for each performance. As a result, the researcher can determine which note-taking strategy resulted in a more successful CI performance aligned with the participants' opinions. Figure 1 displays a bar chart comparing the scores of the two note-taking approaches: blue bars represent hand-written notes while purple bars represent smartphone notes with the English source text.

According to Figure 1, four participants believed they performed better using conventional notes (see the blue bars) when comparing two English-to-Thai consecutive interpreting tasks: one with pen-and-paper notes and the other with smartphone notes. The other two, on the other hand, believed that smartphone notes (see the purple bars) were more effective. In other words, Figure 1 suggests that the majority of participants were in favour of handwritten notes.

*Figure 1 Self-Assessment Scores on CI renditions*
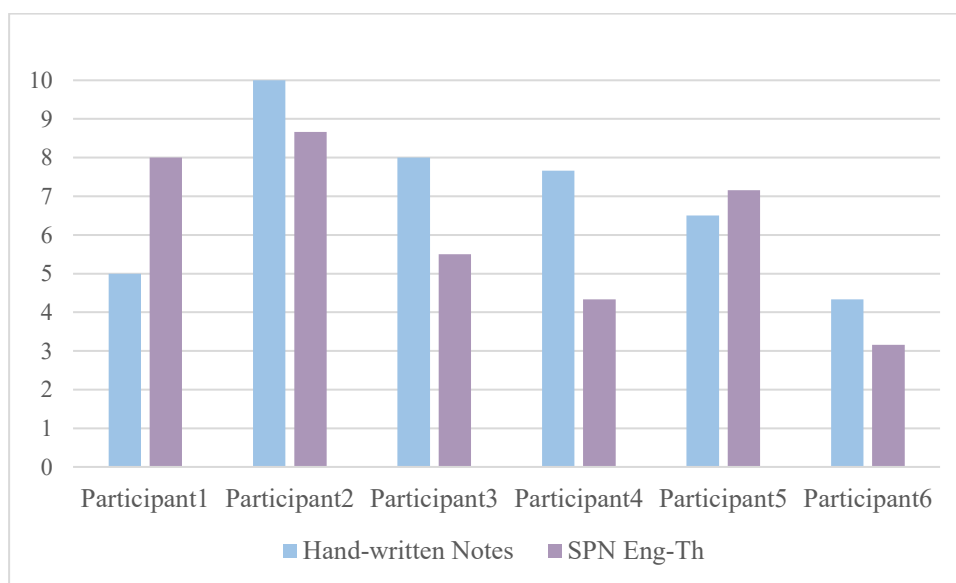
However, when merely considering retrieving information from the notes without the need to translate, five out of six participants rated their performance with smartphone note-taking on a Thai source text as most satisfying, as indicated by the pink bars in Figure 2. In addition, three participants remarked in the interview that they felt the slightest pressure during this particular exercise since "the burden of language translation was lifted," leaving them only with the work of retrieving the information from the note and memory. Participant 3, however, believed she performed poorer with the smartphone tapping compared with her CI using the hand-written note.

Figure 2 displays a bar chart comparing the scores of the three note-taking approaches: blue bars represent hand-written notes, purple bars represent smartphone notes with the English source text, and pink bars represent smartphone notes with Thai source text. Although smartphone tapping was not decidedly perceived to be more helpful than the traditional pen and paper in note-taking for CI, the fact that all participants rated their performance with smartphone in the Thai-Thai note-taking and recalling task most favorably suggests that smartphone tapping is a promising alternative to CI note-taking.

Figure 2 Self-Assessment Scores in All Three Tasks
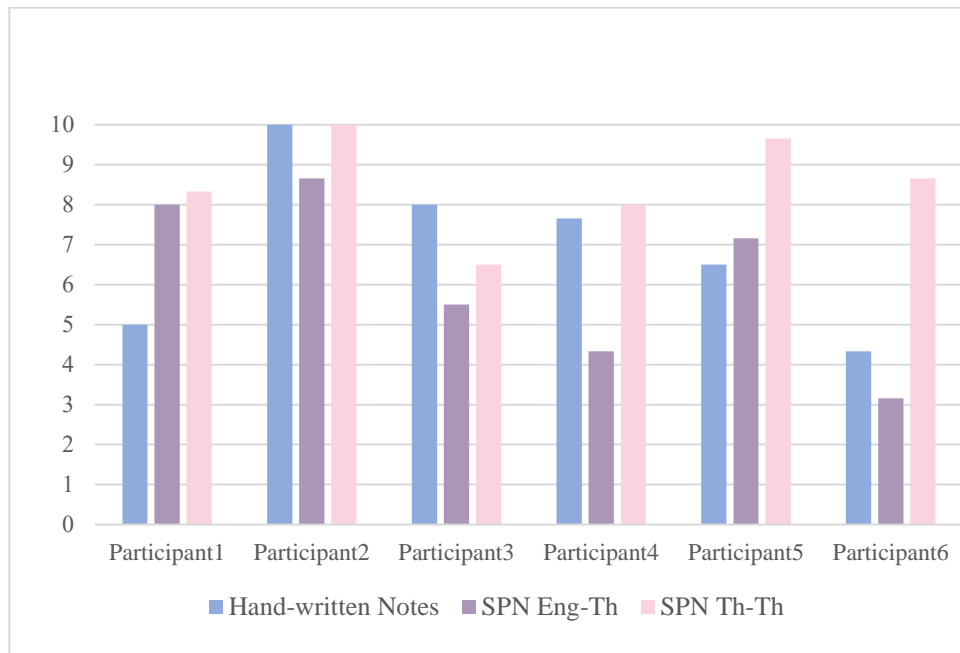
Interpretation Fidelity

The fidelity of the participants' renditions was examined to determine whether the notes taken with a smartphone assisted in retrieving the message conveyed in the original text and whether a new approach demonstrated the result in line with the overall impression evaluated by the participants using the self-assessment forms. According to Han et al. (2021), comparing the output renderings to the source text is one of the two primary approaches to assessing fidelity. The examination was thus carried out by comparing the transcribed source text and the transcribed target text to measure the equivalence between the target text and the source text. The fidelity criteria include mistranslation (-1), omission (-0.5), addition (-0.5), and detail loss (-0.25). The example in Table 3 shows how the researcher computed the fidelity score of each rendition.

Table 3 Example of Score Calculation on Interpretation Fidelity

| Participants 1	Traditional Notes (Eng-Th)	Smartphone Notes	
		Eng-Th	Th-Th
Misinterpretation (-1)	2 = -2	2= -2	-
Omission (-0.5)	-	-	-
Addition (-0.5)	1= -0.5	1= -1	2= -1
Loss of details (-0.25)	3= -0.75	1= -1	1= -0.25
Total score (10)	10-3.25= 6.75	10-2.75= 7.25	10-1.25= 8.75

The total scores were computed and are shown in Figure 3.

According to Figure 3, the findings varied: two participants performed slightly better with smartphone notes. Three others scored poorer with the smartphone notes, and one individual performed similarly with both alternatives. It is thus still inconclusive that smartphone tapping is more effective than handwriting for CI note-taking.

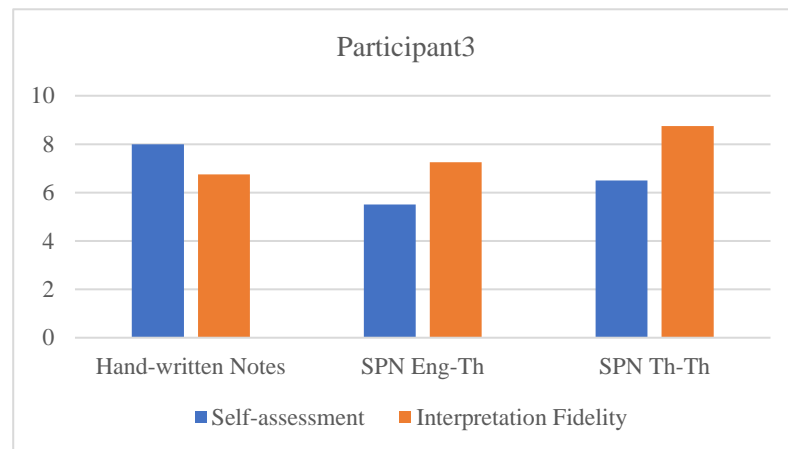*Figure 3 Assessed Scores on Interpretation Fidelity*
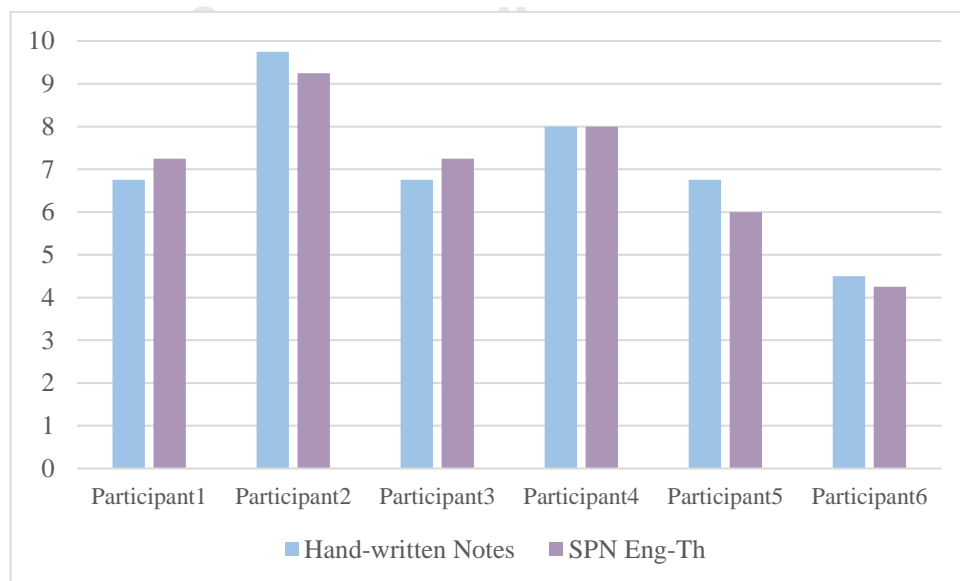
However, when the Thai-Thai activity was taken into account, the results indicated that the Thai-Thai performance had the highest fidelity, as shown in Figure 4. The conclusion here is that when language translation is not required, the note-taking functionality of smartphone notes could be helpful for information retrieval. This trend was similar to that of the self-evaluation figure.

*Figure 4: Assessed Scores on Interpretation Fidelity (Thai-Thai included)*
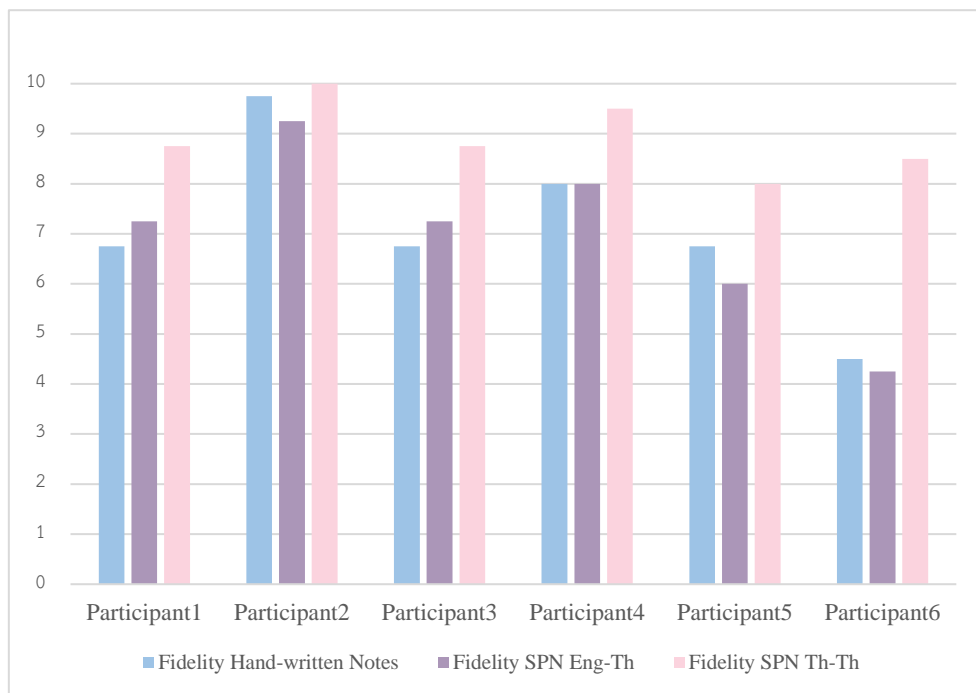
It is noteworthy that pressured participants, who believed they were displeased with the smartphone note-taking and underrated their performances, actually scored better than perceived, particularly in terms of fidelity. Figures 5 and 6 illustrate a comparison of their self-assessment scores with their interpretation fidelity scores, where the participants underrated their CI performances with smartphone notes.

Figure 5 Participant3's Compared Scores of the Two Assessments

Figure 6 Participant4's Compared Scores of the Two Assessments
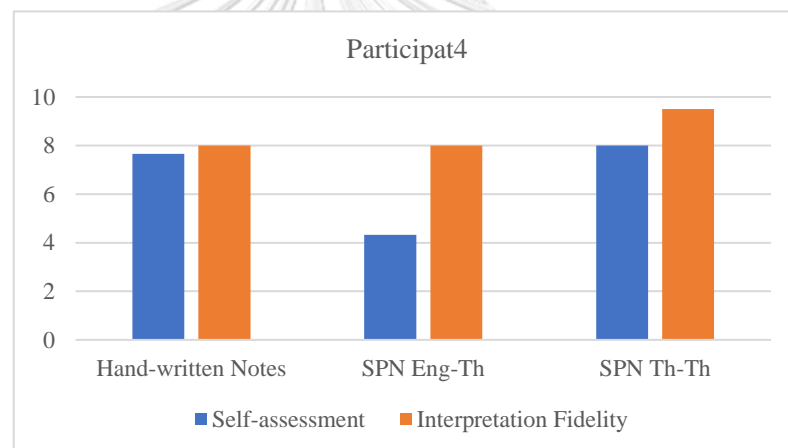
The blue bars in Figures 3 and 4 indicate self-assessment ratings, whereas the orange bars represent interpretation fidelity values. This demonstrates a case where a participant scored their performance rather underrated despite the fact that their interpretation fidelity was higher. Appendix D offers further figures like this one.

Findings from Interview

Finally, the data collected from the interviewees' insightful responses may be divided into two aspects: challenges and benefits, which will be discussed respectively.

On the one hand, every participant reported that taking notes on a smartphone is "new and unusual." As a result, the majority of participants suggested that more practice is needed to build familiarity with both the physical hand movement when tapping on a smartphone and the technical advancement of smartphone offered features. According to Participant 2, "tapping on the smartphone is considerably slower" than writing on paper. "My writing ability is dominant," he remarked, "and I can proceed noticeably faster while taking notes with the continuous text." In this regard, his interpretation fidelity backs up his claim. Furthermore, most consecutive interpreters are generally equipped with the use of symbols to link each fragment of information rather than writing entire ideas. However, this presents significant difficulty for them because the usage of symbols was limited and time-consuming. "I struggled with this method as I could not use symbols... as usual," Participant 4 claimed. Some participants also urged that the experiment be conducted with a larger population so that the results might encompass a broader viewpoint, including both benefits and challenges.

On the other hand, the majority of participants agreed that the smartphone notes could address certain issues that the handwriting may pose. The first issue is illegible handwriting. "The notes on the smartphone are relatively easier to read," and "even with misspelt words or phrases, there is a higher probability that I will recall the original words... much better than when I scribbled." Participant 1 and Participants 3,5,6 agreed on this conclusion. Additionally, people with positive traits including fast tapping speed and touch-typing found this alternative helpful since it allowed them to focus less on the screen while taking notes and more on the speaker's speech, resulting in a better understanding of the overall message the speaker was conveying.

In contrast to their traditional note-taking activity, Participant 5 stated, "I tried to note down all details... it forced me to focus much more on paper, so some main ideas, especially keywords and figures, are missing … This resulted in the discontinuous rendition." In this regard, s/he performed better in the smartphone note-taking task.

Conclusion and Future Study

In lieu of the traditional note-taking, the smartphone approach could be practical in case the interpreter cannot locate a pen and paper, as long as the interpreters "note the right things." Practically speaking, a smartphone is perfect for short CI tasks in which the interpreter may recall recent memory from what was just said while reviewing brief notes. In addition to smartphone tapping, other electronic devices, such as laptop computers, and tablets, may be deployed. In this fashion, as taking notes on a laptop has been common among the students of the current generation, interested researchers may also investigate the effectiveness of CI notes taken with a laptop.

A particular concern, on the one hand, is a lack of professionalism when viewed through the lens of formality. For instance, the sight of an interpreter texting on a smartphone when a speaker is making a speech on stage may give the impression that they are not paying attention. On the other hand, in the case of on-site consecutive interpreting contexts such as liaison events or factory tours, carrying a smartphone would be handier than a laptop. It, therefore, depends on the circumstances, and the interpreters should use discretion in this regard.

Apart from that, fluency would play a vital role as this is a novel technique for most interpreters. Even though interpreters have practiced countless CIs, taking notes on smartphones is like starting from scratch since they are primarily accustomed to using pen and paper. As with other skills, fluency increases with practice and patience and more training is thus required. In other words, this was primarily a pilot investigation with only six student participants. Therefore, to provide a more comprehensive overview of a broader population of Thai interpreters, further research involving other groups of participants and more extensive exercises may be required as there are possible influential factors to be explored.

Different typing speeds may have influenced the current findings, for instance. Therefore, future studies could consider this matter, particularly when recruiting participants. In addition, the stimuli consisted of only three short video clips,

suggesting that longer source texts or a more extensive sequence of CI may have shown different findings when accounting for potential factors such as vocabulary repetition and context comprehension.

REFERENCES

Ferdowsi, S. (2015). Note-taking: A Required Skill of Students of Interpreting. *Review of Applied Linguistics Research*, 45-56.

Gile, D. (1992). *Basic theoretical components in interpreter and translator training*. Amsterdam/ Philadelphia: John Benjamins Publishing Company.

Gile, D. (2004). Translation Research versus Interpreting Research: Kinship, Differences and Prospects for Partnership. In Schaffner, C. *Translation Research and Interpreting Research: Traditions, Gaps and Synergies.* 145- 158. England: Cromwell Press Ltd.

Gillies, A. (2017). What to note. *Note-taking for consecutive interpreting: A short course*. England: Routledge.

Han, C., Xiao, R., & Su, W. (2021). Assessing the Fidelity of Consecutive Interpreting: The Effects of Using Source versus Target Text as the Reference Material. *International Journal of Research and Practice in Interpreting, 23*(2), 245-268. London: John Benjamins Publishing Company.

Hanh, P. H. (2006). Note-taking in Consecutive Interpreting. Hanoi: Hanoi University of Foreign Studies.

Kellett, C. J. M. (2016). Traditional and technological approaches to learning LSP in Italian to English consecutive interpreter training. *LCM - La Collana / The Series,* 103-124.

Kohn, K., & Albl-Mikasa, M. (2002). Note-taking in Consecutive Interpreting. On the Reconstruction of an Individualised Language. *Linguistica Antverpiensia, New Series–Themes in Translation Studies, 1*. Baden-Württemberg, Germany: University of Tübingen, Applied English Linguistics

Lee, B. J. (2020). Smartphone Tapping vs. Handwriting: A Comparison of Writing Medium. *The EuroCALL Review, 28*(1), 15-25.

Lee, S.-B. (2015). Developing an Analytic Scale for Assessing Undergraduate Students' Consecutive Interpreting Performances. *Interpreting, 17*(2), 226-254.

Schoen, I. (2012). Effects of Method and Context of Note-taking on Memory: Handwriting versus Typing in Lecture and Textbook-reading Contexts. *Pitzer Senior Theses*. 20. Retrieve from https://scholarship.claremont.edu/pitzer_theses/20

Appendix

Appendix A

List of Potentially Problematic Terms
- Inefficient
- Livestock
- Fodder crops
- Pasture
- Unsustainable
- greenhouse gas
- genocidal maniacs
- Sow
- Slaughter
- Antibiotics
- Organic
- Yogi Berra – proper name
- Climate change
- fossil fuels
- greenhouse gases
- micronutrients
- Industrial Revolution
- food security
- Sustainable Development Goals
- nutritional quality
- biofortification
- ความมั่นคงทางอาหาร
- อธิปไตยทางอาหาร
-

Appendix B
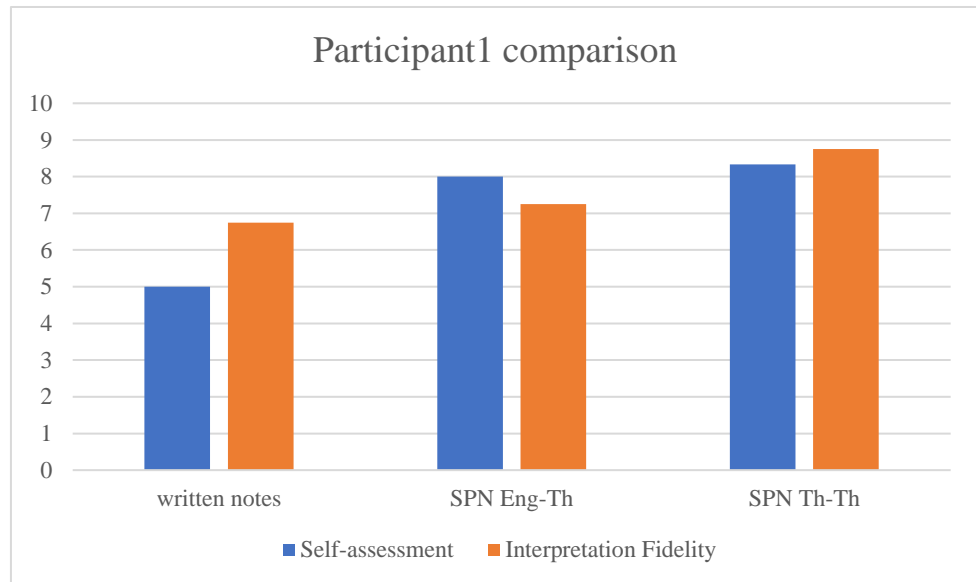
Participants' Final Score for Table3: Self-Assessment Form

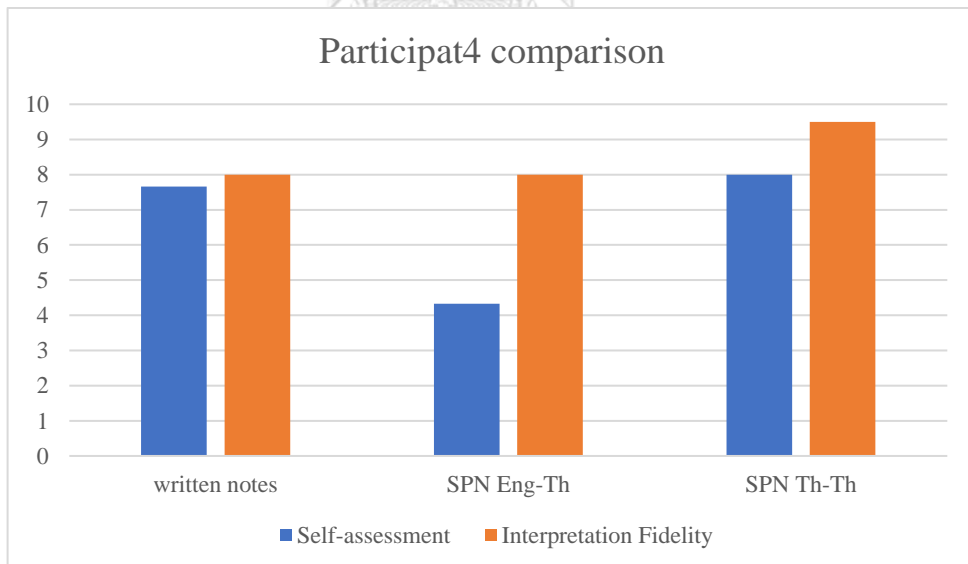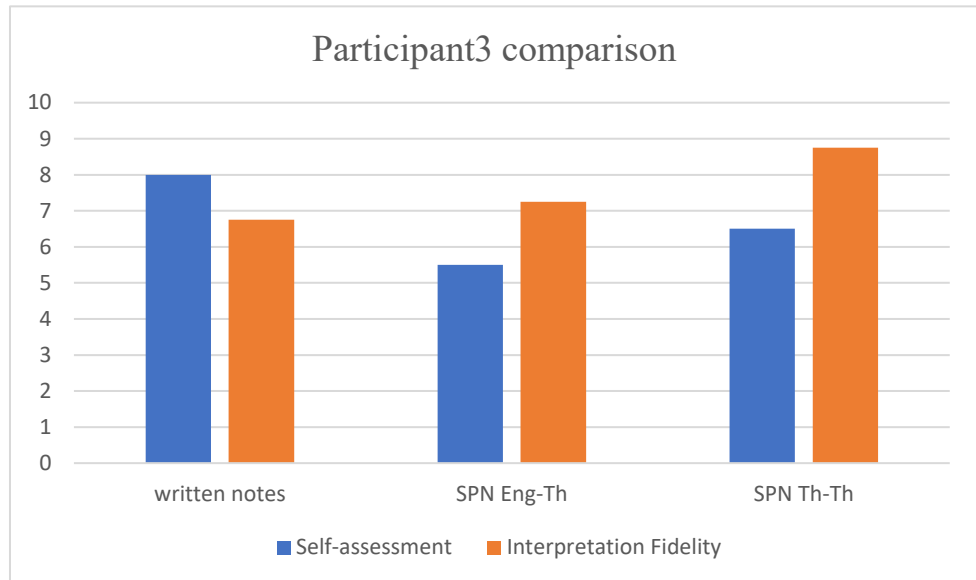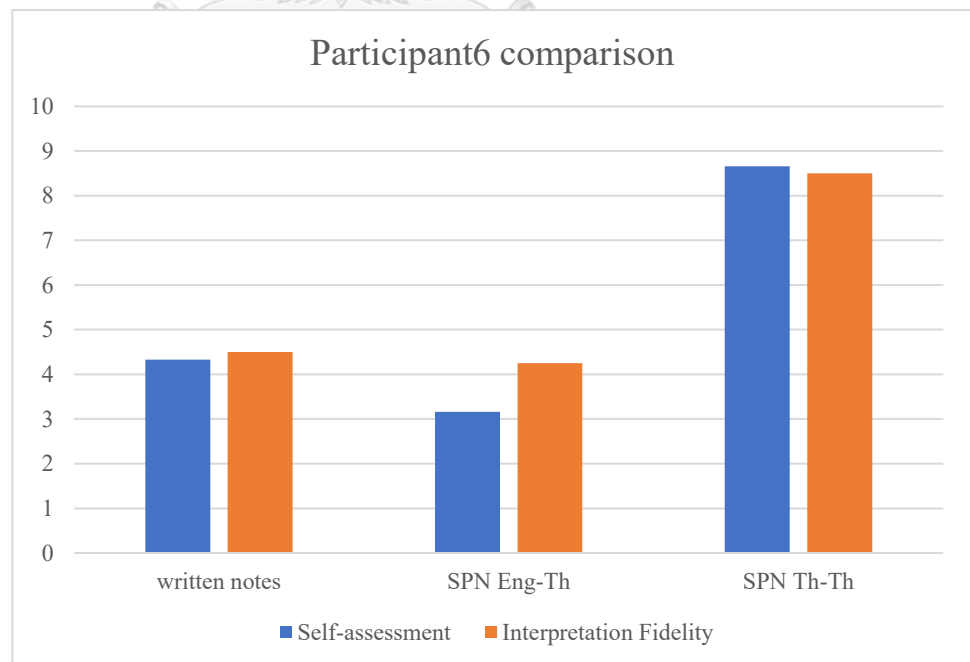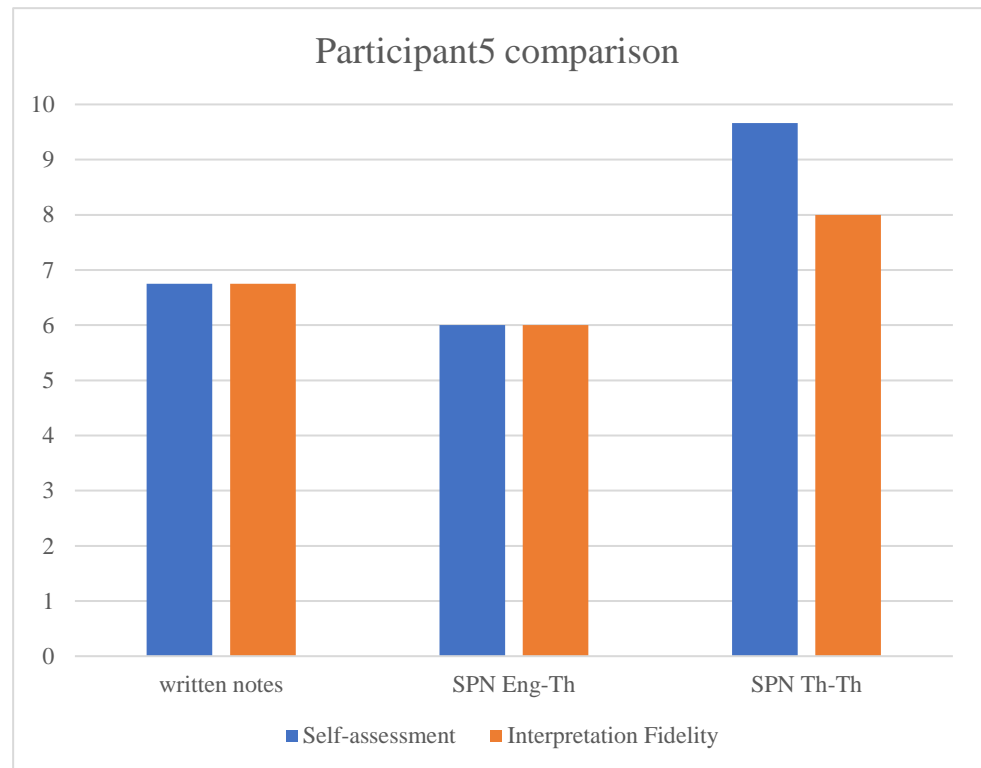| Participant	Written Notes	SPN Eng-Th	SPN Th-Th
Participant1	5	8	8.33
Participant2	10	8.66	10
Participant3	8	5.5	6.5
Participant4	7.66	4.33	8
Participant5	6.5	7.16	9.66
Participant6	4.33	3.16	8.66

Appendix C

Participant's Final Scores for Table4: Interpretation Fidelity Assessment

Participant	Written Notes	SPN Eng-Th	SPN Th-Th
Participant1	6.75	7.25	8.75
Participant2	9.75	9.25	10
Participant3	6.75	7.25	8.75
Participant4	8	8	9.5
Participant5	6.75	6	8
Participant6	4.5	4.25	8.5

Appendix D

Participant1 comparison

Participant2 comparison

Participant3 comparison

Participat4 comparison

Participant5 comparison

Participant6 comparison
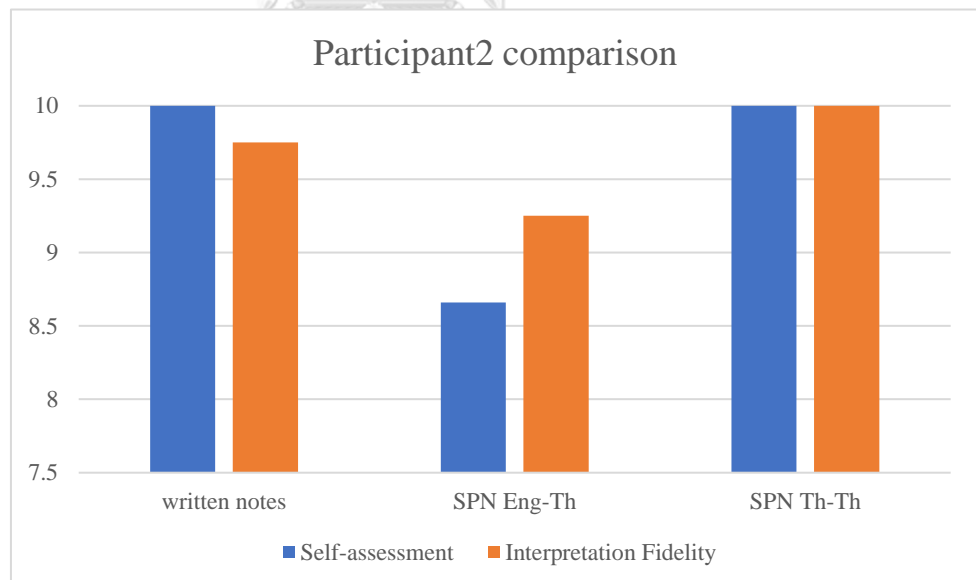
{Gile, 1992 #7;Gile, 2004 #5;Gillies, 2017 #6;Han, 2021 #8;Kellett, 2016 #10;Kohn, 2002 #11;Lee, 2020 #12;Lee, 2015 #13;Schoen, 2012 #14;Ferdowsi, 2015 #4}

REFERENCES

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