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## Does the Use of TAPs Impact a Final Interpreted Product: A Self-study

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Does the Use of TAPs Impact a Final Interpreted Product: A Self-study

By  
Stacey Stevens

An action research project submitted to  
Western Oregon University  
In partial fulfillment of the requirements for the degree of:  
Master of Arts in Interpreting Studies

December 2019

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## ABSTRACT

Does the Use of TAPs Impact a Final Interpreted Product: A Self-study

By

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Master of Arts in Interpreting Studies

Western Oregon University

December 2019

What makes it possible for an English/American Sign Language Interpreter to work between two modes of language? The current study explored this question by examining preparation and direct connection to a final interpreted product. This thesis describes a self-study that sought to pinpoint the cognitive process as it occurs during preparation time to determine the feasibility of the designed method. Utilizing Think-Aloud Protocols (TAPs) and a segment of the Demand Control-Schema as tools, I explore my own process as student-researcher/participant starts an investigation into their own process. The study demonstrates use of preparation time impacting a final interpreter product and uses retrospective interviewing to aid in understanding of one cognitive process.

## CHAPTER 1: INTRODUCTION TO THE STUDY

Impetus for this study began more than 15 years ago, when I—as hearing person—became a practicing professional English/American Sign Language (E/ASL) Interpreter. During my Master’s program, I was exposed to tools allowing study of my cognitive process. Inspiration for this study is rooted in the desire to understand cognitive processes experienced by an E/ASL interpreter. The main tool used is self-assessment via study of video recorded samples utilizing Think-Aloud Protocols (TAPs; Ericsson & Simon, 1980) and the Demand Control-Schema (Dean & Pollard, 2001). This work is a self-study, exploring the use of preparation time and what, if any, impact became salient in the final interpreted product. Data point collection will focus specifically upon spatial referents and their correct application in final interpreted products. The goal is to determine the feasibility of this self-study design before applying it to other practicing professional English/American Sign Language interpreters.

What are the direct benefits of preparation time? Can we concretize the unknowable in such a way? Will preparation time show through in the final product in a clearly articulable way? These are a few questions supporting the overarching research question driving this self-study: Will preparation time be directly seen in a final interpreted product?

A self-study required focus on my use of preparation time, following a method decided upon while developing this study. Self-study of my process allows examination and consideration of elementary aspects of cognitive processing unknown to me. Will

study preparation time be a key factor in understanding my cognitive process while preparing to interpret a pre-determined prompt?

### **Intent and Purpose**

I approached this by examining the function of preparation time and potential impacts on the final interpreted product, asking two research questions: (1) Is preparation time a key factor in a snapshot assessment and (2) Is there an impact in the final interpreted product?

Three data samples will be transcribed from digital video recordings. The first will be an interpreted sample without preparation time; the second will be a sample preparation time; and the third will be the final interpreted sample from the preparation time prompt. The two final interpreted samples will be assessed according to the data point collection of spatial referents and whether they were correctly applied. Analysis will explore if differences occur between the two showing connections to direct preparation time.

### **Rationale**

As the field of professional E/ASL interpreting is rather young—established in 1964 (Stewart, Schein, & Cartwright, 1998, p. 15)—there is still a need to develop an understanding of interpreters' cognitive processes. Then an understanding of a shared cognitive process can be focused on, creating a theory of E/ASL interpreting. To what degree is one aware of one's own cognitive process? Assessing preparation time, how it is used, and what is done or said while preparing may hold a key to opening the door of interpreter cognitive processes. Perhaps a deeper degree of knowledge of cognitive

processing is waiting to be tapped into, and perhaps it is most readily available during preparation time.

Written and spoken language literature related to the use of TAPs (Ericsson & Simon, 1980) commonly compared varying levels of language ability between students learning a language and practicing professionals (Barbosa & Neiva, 2003; Ivanova, 2000; Olk, 2002). Regardless of mode, information can be muddled when comparing varying levels of cognitive processing and second language production ability. Individual understanding of practicing professionals' processes is what drives the present study. Attempting to grasp individual processes requires assessment. Comparing cognitive processes of practicing professionals and students has shown variance in approaching language translation. Focusing on the practicing professional's approach via preparation time, can connections be made illuminating details of the cognitive process?

The student-researcher/participant self-assessment allows for stronger quality of communication in Deaf, Hard of Hearing, Deaf Blind, and hearing worlds. I believe E/ASL interpreters who continually self-assess and self-study their process have a greater quality of interpretation. Being knowledgeable in a topic as an E/ASL interpreter allows for a more thorough interpretation of the topic, tailoring products to consumers more appropriately. Successful interpretations are possible when engaging in an interpretation with little or no prior knowledge of a subject is possible. However, if preparation for conceptual or content area increases the possibility of successful interpretations for the interpreter, what happens cognitively during the exposure to a concept through preparation time?



## CHAPTER 2: LITERATURE REVIEW

### **Self-Study**

Hamilton, Smith, and Worthington (2008) provided a concise comparison of three methodologies often confused: narrative, self-study, and ethnography. Ethnographies encompass a study of large populations or populations greater than a singular focus, whereas a self-study focuses on a single participant. In the scope of this present research, a self-study was determined to be the most appropriate format. Seeing a lack of participant background (Ivanova, 2000; Kovačič, 2000; Myers, 1990) indicated self-studies are needed to appropriately place the influence of a participant's experience within the intersection of their professional and personal lives. This provides greater context regarding the participant. Focusing upon compared samples in self-study potentially gives rise to the participant understanding their own cognitive process more clearly.

Drawbacks to self-studies include lack of understanding the difference between the self-study, an ethnography, and fluidity between them, depending upon the method utilized (Hamilton et al., 2008; Loughran, 2007). There are other issues with self-studies. Delamont (2007) noted, in regard to ethnographies in the field of sociology, the possibility of becoming wrapped up in the information sharing to the point of confusing or removing science from the process. Delamont admonished sociologists who study themselves and not society (p. 4): The focus is not on the individual, but rather on groups. I believe both serve a place in data collection, supporting or refuting each other in order to reach a more cohesive, commonly shared understanding of what is being studied. These assist in prevention of inappropriate researcher-driven conclusions placed upon the

group being studied. In the present work, a self-study will focus on the student-researcher (Loughran, 2007, p. 12), while evaluating the data in potential impacts in the field of E/ASL interpreting.

This self-study has a search for positive approaches to solving linguistic challenges as its goal. Understanding how decision making occurs during preparation time may lead to an understanding of how to create positive improvements in the final interpreted product as an E/ASL interpreter. This study may contribute to a cohesive theory and model for the field of translation and interpreting utilizing preparation time as self-assessment tools and finding themes in those moments, building from the ground up.

### **Think-Aloud Protocols**

**Cognitive psychology settings.** With a self-study as the main foundation, a combination of methods allows utilization of various tools to reach the student-researcher's goal. In studying preparation time and looking for clear marks of it in the final interpreted product, I decided to use Think-Aloud Protocols (TAPs; Ericsson & Simon, 1980) for the investigation. Exposure to TAPs opened up options for understanding one's process of interpreting previously unknown to this student-researcher. Think-Aloud Protocols have a place in scientific inquiry and in particular to what occurs cognitively when interpreting. The act of studying an interpreter live in the moment provides categorical information for multiple levels of assessing cognition.

This work was created first from the exposure of TAPs during the cohort experience. The hidden aspects of human cognition, keeping at bay the understanding of how interpreters produce final interpreted products, may be accessed by assessing the constant thought stream brought aloud and recorded.

Initially, introspective reports relating one's thought experiences (i.e., TAPs) were applied in cognitive psychology settings. This introspection was dismissed as overly qualitative, that is, devoid of empirical validity within the scientific community. Ericsson and Simon (1980), in their search for empirical evidence of internal thought processes, presented a model that became the basis for this study: Think-Aloud Protocols (TAPs). Prior to this no scientific framework for thinking aloud had been established. Ericsson and Simon (1980) provided the initial step in a long road to the development of TAPs by coding verbal and behavioral responses as data for analysis, while connecting this with the cognitive memory process. Simply stated, a TAP asks participants to verbalize the internal thoughts they experience, during a prompted task, combined with the use of retrospective interviewing used as data, gathered and assessed.

The application of TAPs as methodology encounters problems noted by the researchers: "Instructions that require subjects to recode information in order to report it may affect these processes" (Ericsson & Simon, 1980, p. 235). Instead of providing subjects with specific recoding instructions to follow, Ericsson and Simon (believing only the information currently present in the mind can be reported) asked participants to simply report information formed in the internal dialogue. These internal thoughts shared externally as expressions were then coded for data. Data were explicitly analyzed for specific pre-selected variables to be monitored, such as shifts in attention, automation, meta-statements (the overall process) versus micro-statements (the details), and silence markers (p. 283). Secondly Ericsson and Simon (1980) were able to articulate limits to their research: too general a prompt to access long-term memory may misguide one into retrieving similar information, though not the exact information sought, and automation

of responses to this issue. Ericsson and Simon stated, “Incompleteness of reports may make some information unavailable, but it does not invalidate the information that is present” (p. 234). Verbal reports and behavioral responses collected simultaneously permits for consistency checks in the data. Yet, generalized prompts will block the participant from accessing the appropriate responses, thus permitting automatic processes to take control and fill in the details (p. 247). After Ericsson and Simon’s (1980) publication, fields outside of psychology began utilizing TAPs.

**Educational settings.** TAPs have proven beneficial assisting the education of youths and adults alike. In 1990, Meyers, Lytle, Palladino, Devenpeck, and Green provided empirical investigation of a sample of 34 participants exposed to the process of thinking aloud, at three separate times, while reading fiction writing of a sixth or seventh grade level (Meyers et al., 1990). They were able to correlate their findings in reading comprehension growth through the use of TAPs and strategies used to understand the written word. The researchers confidently recommended the use of TAPs as beneficial in clinical practices to expose participants reasoning.

TAPs have been studied in a variety of adult populations as well (Berne, 2004; Bogo, Regehr, Katz, Logie, Mylopoulos, & Regehr, 2011). Instructors in post-secondary education have utilized TAPs for adult basic learning levels (Berne, 2004). In a sample of adults registered in community college classes, 14 were eligible for the study: those with pre-college reading levels between third and sixth grade. After 15 weeks of meetings, having exposed students to the process of TAPs every two weeks as an aid in reading comprehension skills, only one participant was able to articulate the benefit of using self-monitoring—thinking aloud—to aid comprehension. The remainder of the

sample noted skills such as prediction, annotations, and highlighting as aiding in comprehension, immediate benefit of thinking aloud did not occur for this majority. Evidence only presented itself when students were directed to engage in thinking aloud (Berne, 2004, p. 168). While Berne did not find direct support of TAPs in the expected format by spontaneous utilization of, or direct mention of the benefit, in retrospective interviews, there was much data derived from the recorded utterances. Utterances as the data, once coded, proved valuable insight toward the degree students were (or were not) engaging in their cognitive processes over time (pp. 160-168). What might be seen if the timeline were longer is a question of Berne's, and one I found myself asking before I read it in their text.

In a Master's of Social Work program, graduate students' training was investigated by Bogo et al. (2011). They interviewed and recorded six graduate students regarding meta-competencies in the field of Social Work. Participants dialogued with an interviewer regarding specific scenarios—what their responses to specific scenarios would be—then twice engaged in reflective dialogue about the recent interview. Initially participants were exposed to a structured post-scenario interview, followed by a “semi-structured reflective dialogue” (p. 190). Interviews and reflective dialogues were assessed for demonstration of procedural and meta-competencies in the following areas: conceptualization of practice, self-regulation, and professional development (p. 188). Following this, the researchers applied the same process to a second group of 23 participants varying from first-year, second-year, recent graduates, and those of professional status. This additional phase was intended, and Bogo et al. (2011) concluded this approach feasible as a form of assessment of student learning through, or

at the conclusion of, a course (p. 90) while providing applicable variations of contextual example.

As Ericsson and Simon (1980) postulated and the growing data forming support made evident, the assumed qualitative style of verbal data does not preclude it from having empirical use. Utilizing intended markers to code for specific comments, or types of comments, does allow for many fields to investigate phenomena inherent in said fields. I will now look at TAPs in application to translation fields—written and spoken modes of communication.

### **TAPs and Language Transfer Settings**

As stated earlier much information relating to the field of English-to-American Sign Language interpreting addresses students, practicing professionals, and bilinguals (Barbosa & Neiva, 2003; Ivanova, 2000; Kovačič, 2000). This rings true in the field of spoken and written translation as well. Barbosa and Neiva (2003) made comparisons between the groups aimed at revealing information about the differences in cognitive processes among and amidst the groups. In numerous studies and investigations presented in *Tapping and Mapping the Process of Translation and Interpreting Outlook on Empirical Research* (Tirkkonen-Condit & Jääskeläinen, 2000) students, practicing professionals, and bilinguals were assessed or compared to each other (Ivanova, 2000; Kovačič, 2000). Both articles have differences, yet both present an ethnographic approach with a case study from which to appropriately contextualize the pairing of the finalized product and thinking aloud in alignment with the intended goal. The first study looks at a pair of transcribers working together in an ongoing translation task (Séguinot,

2000). The second study investigates practicing professionals in the moments of a live translation task (Gun-Viol Vik-Tuovinen, 2000).

Candace Séguinot (2000) presented the process of two professional translators working together by video recording their computer screen and taking notes while observing their professional processes for two and a half hours. The videotape was transcribed to include both timing and length of pauses and hesitations, then how participants understood world knowledge as combined with the text—via their interactions considering meaning transfer. Séguinot also noted the iterative versus linear processes the participant translators used, revisiting prior assumptions looking for a better representation of the source material in the target text.

Gun-Viol Vik-Tuovinen (2000) presents a case study of two professional interpreters working in a familiar setting, a town council meeting. The researcher in this study is also one of the participants; the second participant is their team for the assignment. The utterances important to focus upon were those in between the interpreted product. These moments when “the microphone was off” and the interpreters freely shared aloud their thoughts became data for Vik-Tuovinen’s research. Half of the coded utterances pertained to the speakers, the other half focused on the meeting procedure or the act of interpreting. Vik-Tuovinen pointed to preparation in the in-between moments of actively working. These two works show data is obtainable using a pre-designed, self-study approach as described in the previous section (Loughran, 2007).

In separate studies with focus groups, predominately studying students and professionals, both Barbosa and Neiva (2003) and Olk (2002) involve TAPs with retrospective interviewing. These aimed to gain further insight into the cognitive process

for the written translation process of young translators still in training as well as professionals and consider the implications. Confirmed by previous studies, different methods of using TAPs are possible in primary investigations. The original intention of my research aligns, with the application of TAPs, that is, (A) all verbalizations are acceptable, (B) the mode of American Sign Language as the final product will not be compromised by the TAP, (C) data to be analyzed, reference to spatial markers/referents has already been decided upon, and (D) use of retrospective interviewing.

Olk (2002) analyzed students of translation via TAPs paired with transcripts of the TAP experience as well as retrospective interviewing. There were six areas of focus in comparing British and German translations (i.e., students in their translations of written text between the two languages). The process contains multiple possibilities for looking at and attempting to understand the learning acquisition process. Lack of cultural awareness and understanding are the biggest causes of mistranslation—realized through the use of TAPs. Also, within this research, multiple confirmations were made in alignment with the previous stated research—students approached the work as a word-by-word puzzle, as something to decode (Barbosa & Neiva, 2003; Ivanova, 2000), whereas professionals continually revised previous work, comparing decisions to prior linguistic problems, translating the text as a whole text at the last moment, not a word-by-word translation, which alters meaning (Jakobsen, 2003; Séguinot, 2000). Through looking at the process in totality, Olk (2002) was able to pinpoint cultural and understanding barriers to successful work products. Students approached the process as breaking a code (Ivanova, 2000; Olk, 2002), using a word-by-word translation process.



Researchers found, through triangulation, the TAP was a tool assisting translation students in translation studies (p. 153).

Barbosa and Neiva (2003) applied TAPs to students and professionals alike to determine what issues faced the two populations. As predicted, the students struggled with understanding the source text; revision of the target text and expression of the target language occurred while reading the source (p. 144-147). Olk (2002) also found data congruent with Barbosa and Neiva's findings. Barbosa and Neiva also found professionals typically reserved the final product through the last moment to finalize all decisions (p. 150); this was also seen in Jakobsen (2003) and Séguinot (2000).

In further support of the previously reviewed translation literature, there is also a study assessing practicing professional sign language interpreters residing in Canada (Russell & Winston, 2014) for effective practices while working. Utilizing TAPs and stimulated recall (retrospective interviewing), it was found the utterances coded led to categorizations showing the effectiveness of the participant's interpretation. In alignment with previous research, Russell and Winston found the most effective interpretations occurred when participants focused on the speaker's goal, as opposed to considering environmental, or linguistic factors.

### **Issues with TAPS and Language Transfer Settings**

Stronger clarification of Ericsson and Simon's TAPs when applied to the translation process was brought forth by Jakobsen (2003). Jakobsen studied translators working between spoken Danish and English via text translation between the languages in four separate tasks. Two of those four tasks were accompanied with a TAP; all information was recorded digitally, as to track revisions made by the professional and

semi-professional participants. Jakobsen found TAPs slowed down the translation process for both groups. Jakobsen suggested reviewing the method, but productive data is not negated simply because thinking aloud slowed down the process of translation (p. 88). Similar to Ericsson and Simon's (1980) work, qualitative data is not bad data! Slow data is not bad data! Data can be utilized in the right application, clarifying the application of TAPs in translation studies.

Inability to completely know what is happening cognitively allows information to remain hidden. Retrospective interviewing seeks to uncover what is hidden during a TAP experience (Barbosa & Neiva, 2003; Ivanova, 2000; Jakobsen, 2003; Kovačič, 2000) to gain direct, authentic knowledge from said participant regarding their unique process. Demonstrated by Ivanova (2000), recall of the thinking aloud experience was shown to be present among practicing professionals in the study (p. 47). It is feasible to apply thinking aloud as a tool to gain access to internal thoughts, following parameters. Timelines in data collection (not slowing the cognitive process down), retrospective interviewing in combination with other data, and general guidelines for producing the TAP will provide data to be assessed. Parameters suggested in the original work by Ericsson and Simon (1980) regarding TAPs are now becoming clarified for the field of language translation.

As the participant in the present study is a full-time E/ASL interpreter, final interpreted products are expected to be a total text translation, not a code-cracking expedition. The application of the TAP—viewing the selected text to be interpreted and thinking aloud, voicing internal thoughts—is thought to provide data, helping to share insight into what happens internally during preparation time. There is support for this

approach in the fields of education and language (Berne, 2004; Bogo et al., 2011) and translation (Ivanova, 2000; Olk, 2002; Séguinot, 2000; Vik-Tuovinen, 2000).

Additionally, will spatial referents provide enough adequate markers to cue recollection of the internal thought process during the retrospective interview, as indicated by Ivanova (2000)?

In the present study the researcher is also the single participant. In place of the retrospective interview, use of the Demand-Control Schema (Dean & Pollard, 2001) will be completed. This will aid in exploring the contextual details that typically remain hidden, while remaining a solo endeavor.

Kovačič (2000) presented analysis of participants' personal worlds impacting their cognitive processes as case studies, and Vik-Tuovinen (2000) presented a case study being a participant-researcher. Pointing to ethnography in the fields of translation and interpreting, utilizing self-study is a way to add more knowledge on the micro-level of working. Viewed in this light, self-studies may lead to a clearer understanding of the various potential contexts under which the participants are operating. Snapshots of the work of E/ASL interpreting through self-study will provide momentary assessments, possible leading to even greater insight.

### **Demand-Control Schema**

In 2001, Dean and Pollard applied Karasek's (1979) Demand-Control Schema (DC-S) to E/ASL interpreters (Dean & Pollard, 2001) as a framework to dialogue about interpreter stress, thereby allowing practicing professionals to analyze the complexities of work within interpreting settings through a conceptual framework. The framework can be used in a semi-structured format aiming at understanding the environmental,

interpersonal, intrapersonal, and linguistic requirements (p. 4); each interpreting setting presents and what the participants bring to the setting. The framework can then be used to assess how these requirements (demands) might be managed, or not, using the skills one has (controls) to match, mitigate, or overcome varying needs.

Dean et al. (2004) went on to partner with the University of Rochester and the University of Tennessee in further designing classroom implementation of the Demand-Control Schema. From this format, DC-S has developed over the years to become a framework for supervision within the field of interpreting. The breadth of the DC-S in application to interpreters by Dean and Pollard (2001) is in no way completely exhausted in explanation here.

The present study starts on the ground floor: assessing intrapersonal considerations that occur during a TAP, using the DC-S as a theoretical construct (p. 151). The goal is to learn more about a cognitive process, becoming a tool for personal growth and development within the field. By reviewing the TAP, within the DC-S format assessment of demands and reviewing the preparation time sample, data collection points will be recalled and expanded upon. Recalling cognitive processes are expected as indicated by Ivanova (2000).

## CHAPTER 3: METHODOLOGY

Three video-recorded samples were produced from Ted Talk video prompts (Moore, 2012; Sonaar, 2011). The first sample was an interpreted product without utilizing preparation time. The second sample was an example of preparation time employing TAPs. The third sample was the final interpreted product utilizing the same prompt as sample 2. The two interpreted samples were assessed for a specific linguistic function of American Sign Language, the use of space as indicated by the index finger to refer to previously established referents. Each time the index was used, it was flagged for further assessment. Initial assessment will note where use of the index occurred, followed by the number of correct referrals back to the initial index. Following the recommendations of prior research to include retrospective interviewing (Ivanova, 2000), the Demand Control-Schema (Dean & Pollard, 2001) was applied to help glean more information from the TAPs.

Sample 2, used to capture the TAPs, was assessed for connections in the final product of sample 3. In sample 3, were these referents alluded to, spoken about directly, or signed about during sample 2? This signals a potential connection between the TAP and the final product to be investigated further. Quantification of specific sign productions, via notation of the use of the index finger, was expected to provide data representing decisions made during sample 3.

The environment in which the samples will be made is the participant's home office. The participant is a full-time university staff interpreter, a middle-aged, White female from the American South, who has resided the last 16 years in the Pacific

Northwest, holding a certification level of Generalist from the NAD. For all samples it was assumed the consumer was fluent in American Sign Language and English with a Master's level of education.

Data collection was as follows. Sample 1, was produced with no preparation time included from the TED talk "Why is the 'x' unknown?" (Moore, 2012). Sample 1 was interpreted first, in order to imitate real-world experiences, generally with limited or no preparation time. Sample 2, the preparation time utilizing TAPs was applied to a second TED talk "Meet the Water Canary" (Sonaar, 2011). After the utilizing preparation time sample 3 was recorded. After creation, all samples were transcribed.

The TED talk video was not stopped or re-recorded; interpretation was completed in the first attempt, aligning with the typical interpreting experience. The interpretation went from the source language of English into the target language of American Sign Language. The participant began recording, started the video to be interpreted, and interpreted the task creating sample 1.

The participant proceeded to produce sample 2. The participant began recording, then started the TED talk "Meet the Water Canary" (Sonaar, 2011) to initiate the TAP. The video was watched as many times as needed for the participant to become familiar with the topic. While watching the TED talk, the participant talked aloud verbalizing any ideas, concepts, words, and/or phrases internally thought and indicating when general understanding was lacking. At times the TED talk video was paused in order to investigate new terminologies, concepts, and/or ideas. Google was used for accessing research and preparation tools. After completing the TAPs, the participant read the transcript of the second TED talk completely, before creating sample 3. Again, the

interpretation went from the source language English, into the target language American Sign Language. As the video began the participant interpreted, having had preparation time.

Once samples 1, 2, and 3 were completed, the researcher began the transcribing process. During the process of transcribing, it was noticed the use of the index finger was present. Each time the index finger was used it was flagged for further assessment. Further assessment was used to note where use of the index finger occurred, followed by the number of correct referrals back to the initial point made. All uses were then underlined throughout the transcriptions to demarcate where data may be located in the samples. Demarcated indexes were further assessed regarding number of spatial referents utilized in samples 1 and 3. Utterances during sample 2 were categorized according to the Demand Control-Schema for retrospective interviewing. Connections were then sought between utterances in sample 2 to the final sample 3.

## CHAPTER 4: RESULTS

The present self-study, a Think-Aloud Protocol (Ericsson & Simon, 1980) and the Demand-Control Schema (Dean & Pollard, 2001) were combined to assess a snapshot of a single E/ASL interpreter's preparation time. Samples 1 and 3 brought forth index finger references to assess for spatial referents. The use of the index finger referencing was chosen as an indicator to make data collection as clear as possible, for the researcher, to find, code, and assess. Sample 1 provided three points to assess and sample 3 provided two points to assess. Within sample 1 (see Figure 1), the three points of assessment occurred rapidly after initially establishing the sign.

11) SPAIN <u>IX</u> point left (Dom ref cross body) DECIDE DO-DO -Referring to Spain in space. (2:02)
17) <u>IX</u> (dom point to CL) -Referring to CHI just drawn with CL. (3:48)
18) <u>IX</u> (dom point to CL) REPLACE C-H-I BECOME -Referring to CHI just drawn. (3:49)

*Figure 1.* Referents from sample 1

For example, the first data point's initial indicator established Spain in neutral space as if viewed from a map. In two seconds, a reference was made back to the same initial indicator. The next two data points followed suit. Referent topics were established and referred to within seconds. In both of these the topic was the same, and maintained the same space in which it was established. Sample 3 (see Figure 2) data reflected similar results to sample 1. The referent topics were established, and within three seconds, reference was made back to them. Data points in sample 3 were signed initially in the same space and referred to again in the same space.



1) DOT DOT DOT (high forward right space) <u>IX</u> nondom circles -referring to the dots at the top right of screen (3:03)
2) Low left dots <u>IX</u> dom circle high right dots (headnod) CAN DRINK -referring to the dots at bottom left of screen (3:07)

Figure 2. Referents from sample 3

### TAP Data

During sample 2, the TAP collection (see Figures 3 and 4), the TED talk (Sonaar, 2011) was watched twice. In the first viewing of the TED talk, a majority of utterances focused on hearing clearly what was said and describing what was seen on screen. There were also utterances regarding the speaker, fillers, predictions, and brainstorming while researching unknown information (i.e., acronyms).

The first viewing of the TED talk totaled 15 utterances, referencing the topics noted previously. Examples include: hearing correctly, “Cholera, Choleri. What is this? In Haiti?”; fillers like “Ah” and “Oh” indicated comprehension of the speaker. Brainstorming was evidenced by, “So, contaminated, dirty, poisonous. Mmm, alright.” Utterances of “GPS, GSM, GSM” denoted acronyms to investigate more thoroughly in order to gain understanding of the technology being discussed.

1) “So it flashes up a shot of umm storm tracking technologies and uh to me it looks like storm tracking technologies. It could be water issues.” -what I see on the screen, predicting what may come in the presentation
2) “It’s a well-paced presentation, he’s not going too fast and I assume the word he said at the first is cholera. I still can’t figure that out.” -regarding the speaker and internal debate as to what I first heard.
3) “GPS, GSM. GSM” -regarding what letters were heard to accurately investigate meaning.

Figure 3. Utterances from the TAPs, first viewing

In the second viewing of the TED talk, there were nine utterances. These utterances focused on comments about the interpretation, self-talk, clarifying what was heard, and further research of acronyms. In this viewing, “Cholera, how do you spell that right?” was followed by, “So I did spell that right.” In the area of self-talk, “Water Canary, hopefully water bird does not come off my hands.” In clarifying what was heard, “To use what agents? Reagents.”

Sample 2 was reviewed twice and then transcribed. Transcription of the preparation time was intended to aid investigating what cognitive processes were occurring during the preparation experience. Looking for utterances directly connecting the TAPs experience to sample 3, the final interpreted product, providing clues to show where the cognitive process in the TAPs connected clearly to sample 3.

1) “To use what agents? Reagents. -clarifying what was heard
2) “So I’m now asking to see the transcript.” -opening the, who am I now asking?
3) Reading transcript, “So yeah, he did say uh, ‘no waiting for chemical reactions to take place no need to use REAGENTS that can run out’ and uh ‘no need to be an expert’ -verifying what I though was heard

*Figure 4.* Utterances from the TAPs, second viewing

### **Demand Control-Schema Data**

The Demand Control-Schema (Dean & Pollard, 2001) proved a valuable tool for the retrospective interview, coding of environmental, intrapersonal, paralinguistic, and interpersonal domains of the preparation time in sample 2. Fourteen comments were made in total, revolving around intrapersonal aspects of the experience. Environmental demands were second, with four points notated about location and explanation of the

mock setting mentally established prior to the interpreting process. The interpersonal and paralinguistic aspects of the schema each had no comments.

Second-guessing and personal triggers were the broad categories noted from the Demand Control-Schema framework (Dean & Pollard, 2001). As sample 2 was reviewed the second time (see Figure 5), it became clear thoughts were focused more on second guessing what was understood—attempts to provide a clean interpretation—as well as including opinions regarding the topic. The final statement made in sample 2 was, “If I don’t understand neither will the consumer.” This train of thought lends itself to concerns about being clear.

<b>Environment</b>	<b>Intrapersonal</b>	<b>Paralinguistic</b>	<b>Interpersonal</b>
-Home office (mock setting) -Backdrop hung on wall to facilitate video recording -2 dogs present, outside of office -seated for the whole experience	-cholera -coal miners -storms -h20 is important -use of google: 1) GPS-GSM 2) follow up before second viewing GSM 3) second viewing, spelling of cholera -brainstorming contamination -thought unfinished -technology lingo -map dots may be the only potential data -concerns of letting down the client		

Figure 5. Retrospective Interview Demand Control-Schema (Dean & Pollard, 2001)

Expectations of making direct connections between the TAP utterances in sample 2 through the DC-S (Dean & Pollard, 2001) to sample 3 were unfounded. Information

gleaned pointed more toward personal viewpoints rather than explicitly pinpointing thoughts from the TAPs impacting the final product. I found the focus to be on the appropriate understanding and concern for not representing concepts properly in American Sign Language as mentioned in sample 3 (and shown in Figure 4). For example, “reagents” was not completely believed to be the word understood until reading the transcript. The same followed with questioning the acronyms “GPS, GSM, GSM” wanting to make sure the acronyms were heard accurately to keep the original intention of the speaker when interpreting into a different language, American Sign Language.

### **Assessment / Results**

Samples were assessed specifically for use of space, a linguistic function of American Sign Language, and correctly referring to concepts previously established. Also, information noted or recognized within sample 2 TAPs directly impacting the final interpreted product of sample 3 were assessed. Assessment focused on preparation time utterances directly linking to the final product. Initial coding focused on identifying the use of the index finger, indicating reference to an already established concept in the signing space. In keeping with recommendations of prior research, using retrospective interviews, the Demand Control-Schema (DC-S; Dean & Pollard, 2001) was applied.

Within samples 1 and 3, numerous indicators were present, 32 combined from the samples. This focus upon the data collection of spatial reference was included in the design to create a starting point for data collection leading to the retrospective interview. The use of the index finger to represent a concept in neutral space was noted in sample 1 a total of 20 times. These 20 indexes were notated for further assessment. Narrowing the data pool to the focus of indexes referring to a previously established concept narrowed

the data to 3 points in alignment with the goal of spatial referencing. Sample 3 yielded a total of 12 indexes for further assessment and was narrowed to 2 points in alignment with the goal of spatial referencing. Sample 2, the preparation time, contained 23 utterances in the complete TAP treatment from 2 viewings. Viewing 1 contained 14 utterances, and viewing 2 contained 9 utterances. None of these utterances were found to make a direct connection to sample 3, the final interpreted product.

Reviewing samples 1 and 3 narrowed the potential data points to assess those in which a concept was established and referred back to at a later time. After coding for each index reference point, data was further assessed, narrowing data to only the points of focus in the present study. Index references indicating a referent previously established in space. Data points reduced to three in sample 1, and in sample 3 it reduced to two. Not all use of the index finger indicated reference to a previously established sign; the data pool needed to be clean to work with the data desired. The DC-S review of the TAPs treatment provided no direct indications as to how the preparation time impacted the final product. The intrapersonal domain was the most heavily reported in comparison to the environmental, interpersonal, and para-linguistic domains. Fourteen points were reported in the intrapersonal domain. As the present focus was a self-study it becomes clear the other categories of the Demand Control-Schema were not applicable. No others were included in the process, keeping all information within the intrapersonal category.

Total utterances for sample 2 was 23 times. None of these made connections to the two referents in sample 3. In sample 3, use of the index finger occurred were references to previously established concepts. In sample 3, use of the index finger occurred 12 times. As with sample 1, these were referenced within seconds of

establishing the spatial referent. This, however, does not preclude useful information from being obtainable.

Sample 2 was also transcribed to find information connecting the preparation time to the final product, searching to connect direct utterances within the TAPs to signs used in sample 3. In the search for data from the TAPs, looking for what impacted decisions and sign placement choices in the interpretation of sample 3 proved unfruitful. No direct correlation was found between the TAPs and sample 3.

Utilizing the Demand Control-Schema as the retrospective interview allowed samples 2 and 3 to be recalled, as indicated by Ivanova (2000). However, additional potential to find data connections between the TAPs and sample 3 was less than anticipated. It was noticed the utterances focused on what was heard and predicting what the speaker was speaking about. This led to limited answers in assessing the environmental, paralinguistic, interpersonal, and intrapersonal aspects of the framework. The majority of recollections and reflections fell within the intrapersonal aspect of the Demand Control-Schema, due to the controlled and contrived environmental setting.

In reviewing the transcripts, no obvious utterances connected the two data points to preparation time. The intended goal was to find information deeper than what was obtained by finding referents with a longer time separation between establishment of a sign and reference back to the sign. This was not supported. Neither does the data support the direct connection between preparation time and the final interpreted product as predicted.

## CHAPTER 5: DISCUSSION AND CONCLUSION

As exploration into the cognitive process started, it quickly became apparent that focus on the participant's use of references in space was the best fit for the scope of this research. Information was transcribed, coded, and organized to explore whether preparation time generally assisted in a final interpreted product. Data collected seems to answer the research question in a null way. There were no direct connections between TAPs and the final product in this pilot study. None of the data points from sample 3 pointed explicitly to correlation of data found within sample 2. Retrospective interviewing gleaned information of personal benefit to the participant, who gained information about her own cognitive process. Data reflected appropriate use of space, seen in samples 1 and 3, in the 5 data collection points. These consistently demonstrated accurate use of referencing back to the previously established concept. Through self-study, I was able to see accurate application of spatial referents—allowing me to know where strengths lie within my interpreter-cognitive process. Finding these strengths, or finding areas to improve and taking steps to improve those areas, do not benefit only the E/ASL interpreter. This will ultimately benefit stakeholders—Deaf, Deaf Blind, Hard of Hearing, and hearing consumers—by being aware of one's processes and to continuing to grow understanding of it.

The Demand Control-Schema analysis elicited considerations behind internal thoughts. The degree to which the Demand Control-Schema data directly correlated sample 2 to the final interpreted product of sample 3 was limited. The self-led assessment based upon a categorical approach was a static experience. To remedy this,

inclusion of other practicing professionals to interview the participant may have led to a deeper understanding of what was behind the thought process. Outside perspectives in the interview experience may have expanded the data pool enough to allow for direct connections between samples 2 and 3 to be made evident.

Data gathered from this study leads to more questions than answers about the cognitive process of an E/ASL interpreter. It serves as a pilot study; there is now opportunity for refining of the methodology in application beyond the assessment of linguistic features in interpretations. Prior to this study the participant was unaware of how they used preparation time, or how it impacted their cognitive process when interpreting a final product. By engaging in this method, data produced provided information regarding the use of space, yet lacked direct connections of the thought process in sample 2 to sample 3. The length of the video produced limited data as did the small sample size. Increasing the length of prompt time may allow for significantly more data to be assessed, thereby providing a larger data pool. Growing the sample size beyond a study of one may indicate whether limited data was solely participant driven or if a larger sample size would yield more significant results.

## **Conclusion**

Overall, the main goal of this study—to assess the successful application of an unknown methodological approach—worked. As the exploration into cognitive processes started, a single subject self-study was ideal as the cognitive processes of each interpreter will differ slightly. It allowed to assess whether the design is feasible, before applying it to a larger group of participants. This self-study produced data assisting in understanding and learning about the student-researcher/participant's cognitive process. Though the



data collected on a very specific and narrow question about the use of space were slim, the process of developing this methodology can be applied in many circumstances and in response to many questions about the work of interpreters.

The main goal of this present study was to test feasibility of this design, rather than to define the cognitive process. This goal was met; the self-study design showed feasibility and produced actionable data. In order to gain more data, including other practicing professionals during the retrospective interviewing segment is recommended. Gathering together varying perspectives, curiosities about the sample, and approaches to the work all aiming to support review of a self-study may benefit the A/ESL interpreter in understanding their own cognitive process. These practicing professionals' questions may draw forth considerations previously unrecognized, until others assisted them in review of the self-study.

It would be helpful, in the retrospective interview process, to have questions predetermined to stimulate initiation of the conversation. Yet the interviewer(s) need to be open to additional questions if they present themselves. If new data arises within the retrospective interview, allowance for investigation of those new ideas may lead to greater insight. When considering the involvement of other practicing professionals, it may be of benefit to choose those who support you in a positive manner. If helping to draw out previously unnoticed information for the A/ESL interpreter undergoing self-study is the goal, carefully choosing those who engage in the retrospective process is important. Working with those who already have a working understanding of the participant's process may help to draw out information from the participant in a positive manner. The goal is to find support and to grow the process in a positive manner, not

allowing self-destruction at the hands of another practicing professional. Include individuals who will benefit the retrospective interview process in terms of respect of self and others' work while dialoguing about the samples. Bringing a genuine sense of investment into improving the process, participants in retrospective interviewing benefit.

If we begin to collect data individually, then aggregate those results into a larger data pool, we then can approach the larger data pool in a meta-analysis approach. Through a meta-analysis approach will perhaps lead through a backdoor into the cognitive process, instead of trying to tackle it head on.

I now would like to explore future applications of this design, as there are numerous approaches to self-study.

### **Application to Students**

I will begin with application to students. As they are developing their skills, the TAPs experience may assist them to see aspects of their work sooner. This may give them the ability to look for how they can fortify successful approaches, and help them become aware of less successful approaches that require adjustment to the process. I caution, as the student process is in development to include supportive yet neutral practicing professionals in the retrospective interviewing process. Neutral practicing professionals are those who have the knowledge to provide support and are able to maintain a respectful manner, while being honest about what is seen in the work. They become a guide for the student, able to celebrate successful approaches and support them in helping to find ways to make the adjustments required.

## **Application to Practicing Professionals**

In application to practicing professionals, I offer examples to stimulate ideas of what to assess. I will begin with biofeedback, specifically the function of breathing while interpreting. Creating one sample without preparation allows us to see what the baseline of breathing is while interpreting. From a second prompt engage in a TAPs experience. In addition to what goal is picked for analysis in the interpreted samples, keep in mind whether the prompt will cause breathing to fluctuate. Interpret the prompt when ready. Transcribe all samples, code samples 1 and 3 for the pre-determined goal and breathing patterns to be assessed. Assess for breathing patterns possibly connected to the cognitive process when producing the work. Can one learn to use breathing techniques to assist in moments when the work is reaching points of becoming overwhelming and/or compromised, in order to regain control of what caused the experience and maintain integrity of the work? Through retrospective interviewing, involving others may lead the practicing professional to understand how their own processes are connected to breathing.

The next option I will share relates to the limits of cognitive processing. At what point does the interpreter become overwhelmed, no longer able to produce quality work? I'm referring specifically to the speaker's pace. Following the design as laid out previously, add a third sample to the process. Interpret the prompt as is. Then add a twist, interpret it again at a faster speed. Even possibly interpreting the prompt a third time (creating a fourth sample) with increasingly more speed than the second interpretation. Continue the process until maintaining a clear interpretation is no longer possible. Transcribe, code, and assess all samples, then follow up with the retrospective interview including other E/ASL practicing professionals to help open up consideration

of how the process broke down. This helps us understand more in depth how the speed caused overload. This may lead to finding one's maximum capacity limits and growing cognition capacity for speaker's pace.

The attempt to seek out a design to benefit the understanding of various cognitive processes succeeded. Repeating this design, pooling more data regarding individual self-study, may lead the field of E/ASL interpreting to reaching a more defined understanding of what occurs cognitively while interpreting. This will require time and patience. Time to gather, transcribe, code, and assess the data. While working in the assessment stage remain neutral; be true to the goal of finding actionable data upon which to develop skills relating to the interpreting process—and thus the final product—in a positive, successful manner. Respect the data; assess it honestly and fairly, not for what is wanted to be seen. Remember the goal of this design is to improve the quality of one's work. Remain neutral and kind to yourself in order to ultimately improve the quality of your own work. Keep the data truly usable and beneficial. For those engaging in this design in the future, remember to enjoy the process; you will discover information to help you grow. Through that growth all persons involved benefit: yourself, your colleagues, those looking to you as an example to follow, and most importantly the stakeholders.

The overall goal of connecting verbalized mental thoughts to a final interpreted product is worthy of further exploration. Had the prompts used been longer, if there were more participants involved in the sample, or if the present study included repetition of the process using different prompts, the data may have been grown to provide more significant results. The significance may have been stronger. Alternate considerations for future study include assessment of more factors. Rather than focus upon one aspect of

American Sign Language from which to collect data, it may be helpful to assess data on multiple aspects, such as fingerspelling correctly, omissions, or palm-orientation focus. Another consideration is the use of pauses while interpreting.

Analysis of the DC-S and the TAPs gave insight beyond the narrow focus of spatial referents, which may prove useful in future investigative endeavors. Meanwhile creating a larger sample and inclusion of a face-to-face retrospective interview may correct the issues found within this study. An issue for future studies, as well, is the challenge of being able to assess one's own work products neutrally and honestly. For those engaging in self-assessment, the responsibility lies within that population to uncover what happens cognitively. This is one puzzle that keeps us all in constant suspense.

The search to understand how the processes work continues! The design was proven feasible. In order to gain stronger data, including outside perspectives are recommended during the retrospective interview. Using longer prompts grows the data pool, potentially providing more opportunity for questioning during the retrospective interview to support correlation of samples 2 and 3. By combining these tools in a self-study approach, an E/ASL interpreter may find the ability to assess aspects of their cognitive process they previously considered unable to investigate.

## REFERENCES

- Barbosa, H. G., & Neiva, A. M. (2003). Using think-aloud protocols to investigate the translation process of foreign language learners and experienced translators. *Benjamins Translation Library*, 45, 137-156.
- Berne, J. (2004). Think-aloud protocol and adult learners. *Adult Basic Education: An Interdisciplinary Journal for Adult Literacy Educational Planning*, 14(3), 153-173.
- Bogo, M., Regehr, C., Logie, C., Katz, E., Mylopoulos, M., & Regehr, G. (2011). Adapting objective structured clinical examinations to assess social work students' performance and reflections. *Journal of Social Work Education*, 47(1), 5-18. doi:10.1080/026154979.2011.540392
- Dean, R. K., & Pollard, D. (2001). Application of Demand-Control Theory to sign language interpreting: Implications for stress and interpreter training. *Journal of Deaf Studies and Deaf Education*, 6(1), 1-14. doi:10.1093/deafed/6.1.1
- Dean, R. K., Pollard Jr, R. Q., Davis, J., Griffin, M., LaCava, C., Morrison, B., ... & Suback, L. (2004). The demand-control schema: Effective curricular implementation. *CIT: Still shining after*, 25, 145-161.
- Delamont, S. (2007, September). Arguments against auto-ethnography. Paper presented at the British Educational Research Association Annual Conference (Vol. 5, p. 8).
- Ericsson, K. A., & Simon, H. (1980). Verbal reports as data. In *Psychological Review*, 87(3), 215-251.

- Hamilton, M., Smith, L., & Worthington, K. (2008). Fitting the methodology with the research: An exploration of narrative, self-study and auto-ethnography. *Studying Teacher Education*, 4(1), 17-28.
- Ivanova, A. (2000). The use of retrospection in research on simultaneous interpreting. *Benjamins Translation Library*, 37, 27-52.
- Jakobsen, A. L. (2003). Effects of Think Aloud on translation speed, revision and segmentation. In F. Alves (Ed.), *Triangulating translation: Perspectives in process-oriented research* (pp. 69-95). Amsterdam, Netherlands: John Benjamins Publishing.
- Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24, 285-307.
- Kovačič, I. (2000). Thinking-aloud protocol-interview-text analysis. *Benjamins Translation Library*, 37, 97-110.
- Loughran, J. (2007). Researching teacher education practices: Responding to the challenges, demands, and expectations of self-study. *Journal of Teacher Education*, 58(1), 12-20.
- Meyers, J., Lytle, S., Palladino, D., Devenpeck, G., & Green, M. (1990). Think-Aloud Protocol analysis: An investigation of reading comprehension strategies in fourth- and fifth-grade students. *Journal of Psychoeducational Assessment*, 8(2), 112-127.
- Moore, T. (2012, February N.D.). Terry Moore: Why is the 'x' unknown? [Video file]. Retrieved from [https://www.ted.com/talks/terry\\_moore\\_why\\_is\\_x\\_the\\_unknown](https://www.ted.com/talks/terry_moore_why_is_x_the_unknown)

- Olk, H. M. (2002). Translating culture-a think-aloud protocol study. *Language teaching research*, 6(2), 121-144.
- Russell, D., & Winston, B. (2014). Tapping into the interpreting process: Using participant reports to inform the interpreting process in educational settings. *Translation & Interpreting*, 6(1), 102-127. doi:10.106201.2014.a07
- Séguinot, C. (2000). Management issues in the translation process. *Benjamins Translation Library*, 37, 143-148.
- Sonaar, L. (2011, July N.D.). Sonaar Luthra: Meet the Water Canary [Video file]. Retrieved from [https://www.ted.com/talks/sonaar\\_luthra\\_meet\\_the\\_water\\_canary/transcript](https://www.ted.com/talks/sonaar_luthra_meet_the_water_canary/transcript)
- Stewart, D., Schein, J. D., & Cartwright, B. E. (1998). *Sign language interpreting: Exploring its art and science*. Boston, MA: Allyn and Bacon.
- Tirkkonen-Condit, S., & Jääskeläinen, R. (Eds.). (2000). *Tapping and mapping the processes of translation and interpreting: outlooks on empirical research* (Vol. 37). Amsterdam, Netherlands: John Benjamins Publishing.
- Vik-Tuovinen, G. V. (2000) The interpreters' comments in interpreting situations. *Benjamins Translation Library*, 37, 17-26.