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Abstract

Mindfulness and Interpreter Cognitive Load

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As a signed language interpreter, I must be able to connect with all parts of my brain during interpreting, but much energy is used trying to prevent negative self-talk and managing mental distractors, taking up vital brain space needed to focus on the incoming and outgoing messages. This project will research the effects of mindfulness on cognitive load as a signed language interpreter. I recorded the effectiveness of mindfulness for managing cognitive load by using surveys. The research tracked whether the situation was made more manageable if mindfulness practice was incorporated. Qualitative data was used to investigate my ability to continue interpreting during a stressful situation by using mindfulness techniques, maintaining a balance of cognitive load, and practicing management of incoming personal negative criticism. Quantitative data was taken by using four cognitive therapy surveys and rating blood pressure and heart rate taken before and after Mindfulness Based Stress Reduction class (MBSR). Findings showed a lessened cognitive load during signed language performance with greater attentiveness to the task at hand. There was less negative nagging that had been taking up the brain space required for the interpretation process.

Keywords: sign language interpreting, practice profession, mindfulness, cognitive load

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Chapter 1: Introduction

Interpreting involves "rapid analytical skills from spoken input" (Gillies, 2014 as cited by Johnson, 2016, p. 2). If interpreting is merely restating utterances from one language to another, (Johnson, 2016), what makes the process so arduous? As an interpreter, I have found it cognitively difficult, at times, to perform my best because so much is required of the brain all at once. "Interpreting is a highly complex cognitive activity" (Moser-Mercer, Kunzli, & Korac 1998, p.1). The brain goes through several processes just to get out one concept: "This process requires the interpreter to simultaneously listen, analyze, comprehend, translate, edit and reproduce in real time a speaker's utterance with at least two, languages that must be constantly maintained at a high level of proficiency" (Moser-Mercer et al., 1998, p. 47). Not only that but Pöchhacker (2008) describes how interpreters are often thought of as invisible as they allow communication to be effortless and fluid without noticing the interpreter.

With so many demands happening inside and outside of the interpreter in just seconds, cognitive load becomes a problem that can prevent interpreters from performing optimally. If the interpreter experiences overload, the quality of the interpretation goes down (Moser-Mercer et al., 1998). If fatigue hits and the interpreter feels they must suffer through, a natural coping strategy is to not care if the interpretation is effective or not. Managing cognitive load and all the other components of the environment and interpreting process is integral in producing an effective interpretation. According to Ivars and Calatayud (2013), "the role of attention in interpreting is an extremely demanding task" (p. 1). The interpreter will have a greater chance to lesson demands that take up cognitive space by being attentive to the task of interpreting. One way to have focused attentiveness is by practicing mindfulness. "This [mindfulness] anchors the practitioner in the present moment, and helps them to recognize their emotional state through

concomitant physiological arousal. Remaining equanimously aware of such arousal prevents any reaction to unhelpful or unpleasant moods, and facilitates problem solving" (Chambers, Lo, & Allen, 2008, p. 2). Being aware of these arousals could be beneficial for interpreters. Nadler, Carswell, and Minda (2020) maintain,

> the growing prevalence of mindfulness programs in organizational settings is due in part to the increasing body of work spanning several diverse research areas of showing benefits of mindfulness-based practices on well-being and performance. Mindfulness-based practices have broadly been found to have several benefits including, but not limited to, reducing stress, anxiety, and depression, and enhancing attentional focus, working memory capacity, cognitive flexibility, positive mood, resilience, immune functioning, interpersonal relationships, and well-being. (p. 2)

Because of the benefits of mindfulness in other professions, in this paper, mindfulness effects on interpreter cognitive load will be researched.

Background

As a signed language interpreter, I was having difficulty focusing on the interpretation itself because I was having to deal with parallel streams of thought. One line of thought was on the interpretation of the lecture, while at the same time I was dealing with personal negative thought patterns about my work as an interpreter. I felt a lack of effectiveness in my work and an increased level of stress and anxiety. The unnecessary demand placed on my cognitive load was preventing me from giving my full attention to the stages of the interpreting process. An "interpreter who has difficulty concentrating and shifting her attention between the different efforts involved in interpreting (listening and analysis, production, memory) will likely have a hard time acquiring the techniques of interpreting" (Johnson, 2016, p. 7). Since I was also

returning to the signed language interpreting profession after a several year hiatus, I found the expectations of today's interpreters had grown exponentially. "To this end, post-graduate interpreting programs set rigorous admissions criteria and screen prospective students" (Johnson, 2016, p. 1). I began researching ways to improve my interpretations and in the meantime, decrease inconsequential noise blocking the pathways of the interpreting process. "Many of the difficulties students experience arise not just from deficits in verbal fluency and language-processing agility, but from general, underlying cognitive and affective abilities such as to focus, to sustain that attention, and to tolerate stress" (Johnson, 2016, p. 3). I began to lose confidence in myself as an interpreter and as a person who could interpret in front of an audience. "Interpreting is a very stressful activity not least because it involves the performance of a series of complex cognitive and psychomotor operations in public or at least for the public" (Ivars & Calatayud, 2001, p. 1). For me, cognitive load not only came from the weight of the interpreting process, but when interpreting in front of other people, stress and anxiety increased.

Cognitive load and interpreting go hand in hand but managing the resulting stress is difficult at times. While trying to resolve this issue in myself, I came across research that supported benefits of mindfulness practice in medical professions. Since little research has been done on the potential effects of mindfulness and cognitive load on signed language interpreting, the filling of this gap became a beacon for me to follow. The capacity to control stress has traditionally been considered one of the requisites for interpreting (Moser-Mercer et al., 1998; Ivars, 2001) and a predictor for interpreting competence. Not only was this research important for my interpreting advancement but it may prove beneficial to other interpreters struggling to attend to the task at hand.

Statement of the Problem

Excessive cognitive maunder while interpreting can cause a failure to produce a coherent interpretation of the message being presented. "In cognitive terms, the most fundamental problem in interpreting is that it is composed of a number of concurrent operations each of which requires processing capacity (PC), and the amount of PC required is often as much as - or even more than - the interpreter has available at the time it is needed" (Gile, 2001, p. 1). When an interpreter is choreographing so much information at once, expression of the message can be hindered by any type of distractor, such as, trying to listen but the microphone stops working or somebody dropping a book in the background and the audience turning to see what is happening. This all adds to the cognitive load and makes interpreting more difficult.

With so many demands required from a signed language interpreter at one time, I have found no concrete techniques to counter this difficult problem of cognitive load and realized there is a gap that must be filled. Accordingly, in this research, I examine whether or not being in the moment and practicing mindfulness allows the interpreter to re-center and refocus when cognitive overload happens. If this is the case, the benefits of mindfulness practice in managing cognitive load during interpreting should be shared as a legitimate tool in interpreting.

During interpreting, there is limited cognitive space, so managing that space well is crucial. "Cognitive control refers to a family of attention-related regulatory processes needed to ensure that information processing is in accord with long- and short-term goals" (Jha, Stanley, Kiyonaga, Wong, & Gelfand, 2010, p. 55). By controlling the cognition, there will be ample space for the brain to dialog with the working memory and connect to new information coming in. Working Memory Capacity (WCM) may be stymied. "Working memory capacity (WMC) is used in managing cognitive demands and regulating emotions. Yet, persistent and intensive

demands, such as those experienced during high-stress intervals, may deplete WMC and lead to cognitive failures and emotional disturbances" (Jha et al., 2010, p. 54). Understanding the demands on WMC in relation to cognitive load leads us to question how we can keep the overload to a minimum and get control of that cognitive space.

The main problem that must be considered is the fact that this affects how interpreters are able to perform their work. "Only now are interpreting studies beginning to appear that empirically examine how student interpreters can build the attentional abilities and emotional stability they need to interpret effectively" (Johnson, 2016, p. 9). Since studies looking at interpreting and focused emotional regulation are so new, this led to the initiation of this research in mindfulness and signed language interpreting.

The instigating factor for this study was to find a coping method for myself and other interpreters when cognitive load becomes unmanageable and break-down of the interpretation inevitable. I found, instead of focusing on my interpretation of the lectures, I was battling belittling banter. None of this commentary was helpful and was obstructing my ability to concentrate on the task at hand. I began to feel anxious about my skills and hesitant about interpreting in front of others who may be judging my performance. "During the process of interpreting training the high levels of stress experienced by students when having to speak (interpret) in public can become one of the major obstacles" (Ivars & Calatayud, 2001, p. 1). Ivars and Calatayud (2001) continued by stating that stress is a by-product of anxiety in response to the fight or flight facing risk and uncertainty. Because interpreting is a practice profession associated with humans, uncertainty is the only certainty.

Purpose of the Study

An interpreter must learn how to manage the information presented to them. Their capability to do this can increase or decrease the heaviness of the load. Information load is, "The rate at which information, especially new information, may be introduced into the text" (Larson, 1984, p. 439). Not only does the rate of information being produced add to or decrease cognitive load, there are many other factors that the interpreter can prepare for but not necessarily control. Larson (1984) continues by saying grammatical differences, technical terminology, the style of the speaker, and the knowledge or experience of the audience, play a distinct part in how the load is managed by the interpreter. For example, the speaker may be giving a presentation on how to build a computer. The speaker has a limited amount of time and has a lot of information to present so is speaking at a fast pace. The interpreter's knowledge of the speaker and the subject will help or hinder how the information is interpreted. If there is little knowledge, cognitive load will become difficult to manage because the interpreter is dealing with new material. If the interpreter has interpreted for this speaker before and has a strong base of personal knowledge to draw from, the information will be managed more efficiently and the cognitive load will be lightened. However, not only must the interpreter understand the primary source information, but they must, at the same time, take into consideration the consumer and audience (Larson, 1984). They must ask questions such as whether the audience knows about computers already or have they come to the presentation as beginners. The interpreter must take into consideration this aspect also as they produce their interpretation.

Larson (1984) submits five issues connected to information load. The speaker in the source language may present information that is new and culturally different to the audience. The audience must figure out how to absorb new information at a speed that may be too fast to grasp.

There are usually patterns that happen in one language that may not happen in another. Some languages are redundant and trying to keep up the pace for the interpreter may ease or create a larger load. Lastly, "Some implicit information of the source language and culture will need to be made explicit in the translation. At the same time, some explicit information of the source text will need to be made implicit in the translation" (Larsen, 1984, p. 440). In other words, the interpreting profession is laced with impossibilities that must be considered each time one begins to interpret, and these are just a few reasons stress and anxiety can skyrocket.

The purpose of this study is threefold. First, to explore the causes and effects of cognitive load on signed language interpreting and how anxiety and stress add to the load and if focused mindfulness practice is a viable resource. I am investigating mindfulness as a coping strategy to "strengthen attentional skills and emotional stability under stress in order to build interpreting proficiency" (Johnson, 2016, p. 3). I have researched other professions that have used focused mindfulness with great merit. By practicing mindfulness, my signed language interpreting performance will be more focused causing the work to be more efficacious. "One of the main areas of interest is the use of mindfulness-based interventions (MBIs) to reduce the effects of stress and distress in working adults who are at risk of higher stress due to the nature of their occupation or work situation" (Virgili, 2015, p. 2). Since interpreting has been shown to be a stressful profession, mindfulness practice could be a worthy ally.

Second, I took a nine-week MBSR course and related it specifically to signed language interpreting. The results of the classes and study will not only provide focus during signed language interpreting, but will allow me to delve into the core of my personal tendencies of stress and anxiety. Since tests are a part of most professions, including interpreting, focused mindfulness may allow for stress to be at a helpful level instead of out of control, affecting my

performance negatively during the Educational Interpreter Performance Assessment (EIPA) signed language interpreting exam.

Third, in my research, I hope to fill a gap and add to the limited research interpreters have in their profession. To date there are only two research papers on mindfulness and interpreting (Ivars & Calatayud, 2013; Johnson, 2016). One example is a paper by Ivars and Calatayud (2013) and the other is by Johnson (2016). Both studies are about spoken language interpreting, not signed language interpreting. Therefore, I would like to research the effects of mindfulness while interpreting between ASL and English because of the benefits identified in these articles.

This project has value for other signed language interpreters because although many other disciplines tout the value of mindfulness, there is nothing to date about the possible benefit in the signed language profession. There is much research to be done directly relating to this field. In discussions with fellow students and interpreters I find I am not alone in feelings of stress, anxiety, and failure in my role as a communication facilitator between deaf or hard of hearing and hearing consumers. Mindfulness may be a vehicle which allows interpreters to let go of the negative talk which causes cognitive overload, allowing them to have "compassion and kindness to interpersonal interactions" (Johnson, 2016, p. 113). When a mind is free from distracting stimuli, a more effective interpretation can take place. By applying mindfulness practice to my life, my belief is the rewards will show in my life and my work. By building attentiveness by using a mindfulness practice, I hope to be able to confront anxiety that comes with performing in front of consumers and audiences. With this study, I also hope to contribute to a knowledge base that many other interpreters searching for a useful tool to cope with the demands of interpreting might use as a starting place for their own investigations.

Theoretical Framework and Organization

Choosing the correct theoretical framework was important for the structure of this research. The framework is the "'blueprint' or guide for the entire inquiry providing support and structure to the study, and gives a general world view" (Grant & Osanloo, 2015, p. 13). The theories that shape this research and paper are Cognitive Load Theory (CLT) and Self-Efficacy Theory. CLT's origins began years ago when a researcher named Sweller (1988), studied the Cognitive Processing Capacity (CPC). "The cognitive load imposed on a person using a complex problem-solving strategy such as means-ends analysis may be an even more important factor in interfering with learning during problem solving" (Sweller, 1988, p. 261). In other words, the brain tries to resolve problems in the most efficient manner possible. This efficiency, may deplete cognitive capacity causing the brain to actually work less efficiently. Continuing, Sweller (1988) found,

in order to use the strategy, a problem solver must simultaneously consider the current problem state, the goal state, the relation between the current problem state and the goal state, the relations between problem-solving operators and lastly, if subgoals have been used, a goal stack must be maintained. The cognitive processing capacity needed to handle this information may be of such a magnitude as to leave little for schema acquisition, even if the problem is solved. (p. 261)

Since Sweller's study, researchers in the interpreting field have seen the correlation between cognitive capacity and the tasks required of an interpreter (Gile, 2008; Johnson, 2016; Moser-Mercer et al., 1998). For example, Seeber and Kerzel (2011) explain sometimes interpreters implement a strategy to get more information by waiting for a complete concept before beginning to interpret. This allows for an effective interpretation and eases the cognitive load

temporarily, "however, it causes a spillover effect, leading to a considerable increase in cognitive load downstream" (p. 229). Since there are so many intricacies in the interpreting field connected with the brain, CLT was the best connection to interpreting, cognitive load, and mindfulness.

For this research project, "attention lies at the intersection of CLT, interpreting studies, and mindfulness research" (Johnson, 2016, p. 22). Since interpreters are often operating at their maximum capacity, fatigue can easily set in (Moser-Mercer et al., 1998). Thus, interpreters must learn to manage cognitive load so they are able to maintain stamina. If one has already "hit the wall" after thirty minutes of interpreting an hour-long presentation with no team interpreter, using mindfulness to stay in the moment may lighten the cognitive load according to CLT. CLT has been studied for several years in connection with working memory and full capability. Ginns and Leppink (2019) state that:

> working memory whose capacity and duration limits can be substantially reduced when domain-specific schemas are activated from long-term memory—to generate and test instructional design hypotheses. The cognitive load construct refers to the load placed on working memory by a range of cognitive processes, including comprehension, schema construction, schema automation, and problem solving. When working memory is overloaded by the competing demands of these processes, student learning is impaired. (p. 255)

Johnson's (2016) study focused on examining the CLT on student interpreters. Johnson (2016) found that "CLT predicts that any extraneous processing will consume limited cognitive resources and quickly lead to students experiencing cognitive overload, with a resulting degradation in performance" (p. 32). These findings may hold true for signed language interpreters that have similar demands. Having control of one's cognitive load and working

memory during the interpreting process is the crux of this research. This cannot be done without the proper attitude towards one's self. This is where the second theory, self-efficacy, comes into play.

To describe this theory succinctly would be to say that self-efficacy is "the belief in one's own capabilities, as an effect on what individuals choose to do, the amount of effort they put into doing it, and the way they feel as they are doing it" (Bandura, 1977, as cited by Nolen, 2018, para. 7). This means that one has hope in their ability to improve and even excel in one's work by putting the proper amount of hard work into the practice. For interpreters, self-efficacy may kick-in, and the interpreter can reach into their tool box for coping mechanisms that can help them to complete the assignment to the best of their ability. Yet, according to self-efficacy theory, this can only happen if the interpreter believes they have more to give at this particular moment. If interpreters understand the degree of difficulty of the interpreting profession, they must use any coping skill necessary to help maintain a level of efficiency to complete the task at hand, even if they are feeling overwhelmed. According to Chin (2019) high self-efficacy helps to control stressors. Self-efficacy can act as the grit that keeps one involved in the undertaking. This can be a positive emotion but being fatigued with information overload for interpreters can be detrimental. "Interpreters must be able to manage their own nerves and feelings of efficacy or incompetence such that these internal distractors not undermine their ability to attend to the task at hand" (Johnson, 2016, p. 7). Having the inner confidence to move forward in difficult situations is connected closely with the Self Efficacy Theory.

Limitations of the study

I am researching mindfulness and its effects on cognitive load in my life. The results are not generalizable to other races, genders, ages, work places, and education. The research will be

conducted in an isolated circumstance. I will also be studying human emotions which can vary

minute to minute. Although there will be a variety of emotions studied, they will be limited to

my idiosyncrasies. I will also be gauging data on days that may be easier to interpret than on

other days. I will only be measuring myself in the K-12 education field and not as interpreters in

various settings.

Chapter 2: Literature Review

In this literature review, I will explore the available research individually and in connection with signed language interpreting, cognitive load, and mindfulness. Although each subject has been studied at length on its own, none have connected all three. The following literature review will provide supporting documentation to inform the interpreter of the possible tethering that these three topics could have upon the signed language profession.

Interpreting

In the past few years, research has been done on the well-being of interpreters, both for the interpreter's sake and the sake of the interpretation. "Intense stress combined with anxiety creates overarousal which hinders cognitive functioning, including memory performance" (Searleman & Herrmann, 1994, as cited by Moser-Mercer et al., 1998, p. 49). Stress and anxiety during interpreting can appear for many reasons, not least of which is the demanding process the brain goes through to complete one interpretation. "Interpreters deal with fleeting discourse that must be instantly deciphered, understood, recalled, and reproduced in another language, all in the heat of intrinsically unpredictable human interactions" (Johnson, 2016, p. 2). Findings have proven the complexity of interpreting and the toll it takes on mind and body.

Gile (1997; 2002) has divided the interpreting process into steps called Efforts: Listening Effort (listening to and analyzing the source speech); The Production Effort (producing a target-language version of the speech); a short-term Memory Effort (storing information just received from the speaker until it can be rendered in the target speech); and the Coordination Effort, (balancing incoming information with self-check-ins on production). As the interpreter learns how to coordinate the process of each task, the interpretation will become more effective. "Once interpreters achieve this coordination point, they are able to perform the interpreting job in the

most optimal conditions, since their skills are balanced with the task in question" (Vita, 2014).

The Effort Model helps to target major areas of the interpretation process where mistakes and misunderstandings can be addressed. In addition, Giles (2008) presented the Tightrope Hypothesis. The Tightrope Hypothesis means difficulties in interpreting occur when "total processing capacity requirements exceed available processing capacity (saturation), and when processing capacity available for a given effort is not sufficient for the task the interpreter is engaged in" (Rebas, 2014, p. 1). The combination of the Effort Model and Tightrope Hypothesis attempts to give interpreters a way to evaluate their work in depth by "analyzing interpreting output at local level (roughly at the level of independent clauses or sentences) may yield more insights into interpreting difficulties than considering overall features of speeches" (Gile, 2008, p. 7). Even when analysis and coordination of the Efforts flow, interpreting still requires much effort.

Gile (2001) describes that interpreting is a complex process that requires much attention. When an interpreter is presenting the message fluidly, it is likely the attention is focused on the work. "'Effortless' speech production does require attentional resources, as evidenced internally by hesitation pauses, which reflect intensive efforts to find an appropriate word and/or an appropriate syntactic structure to start, continue or end a sentence" (Gile, 2001, p. 1). If one is not concentrating while interpreting, the message can be heard but easily forgotten as it does not connect to the interpreter's previous knowledge (Gile, 2001, p. 2). "This is true even in one's native language. Similarly, the seemingly 'spontaneous' and 'automatic' comprehension effort also requires attentional resources. If these are not invested into listening, words can be heard and forgotten without leaving meaningful traces in the listener's mind" (Gile, 2001, p. 2).

Additionally, interpretations can suffer because of the demand to produce the best interpretation at all times for the consumer, other interpreters, the employer, and members of the audience, paired with the unreal expectations from the interpreter them self. As an interpreter is in the front of at least two consumers at all times and often audiences, interpreting is closely associated with public speaking. "Once a subject is exposed to public scrutiny the public demands quality– although they may not be able to define exactly what that quality is" (Ivars & Calatayud, 2013, p. 111). Even audience members with no interpreting prowess will comment on an interpreter's work. Thus, the identifying factors for not being crushed by the pressure is "the belief in one's own capability and the real amount of personal resources available" (Ivars & Calatayud, 2001, p. 114). If one has chosen the interpreting profession, one must be able to withstand the pressure, whether in front of a crowd or in front of a video camera when having performance skills tested.

According to Johnson, Bolster, and Brown (2014), testing signed language interpreting performance skills are expected in 42 out of the 50 United States. The Educational Interpreter Performance Assessment (EIPA) is used to test educational interpreters in 24 states with a score of 3.5 or higher and 11 states now require at least a 4.0. Out of 50 states, 35 require taking the written EIPA exam. In my district, pay and job title are dependent on the EIPA score. I feel pressure to perform my best and get a score of 3.5 or better. Therefore, "every single performance entails a new evaluation on the part of the public or employer, so a poor performance may represent an important setback with unforeseeable consequences" (Ivars & Calatayud, 2013, p. 111). Not only could an ineffective interpretation or test scores create job stress, if an individual's identity is tightly connected to their work, imposter syndrome could follow. "Fear of getting a negative grading is partly fear of being considered incompetent" (Ivars

& Calatayud, 2013, p. 118). Without appropriate coping skills an interpreter could lose confidence in their ability to execute their job well and risk their livelihood.

Since interpreting can be a stressful and taxing profession both physically and mentally, a study done by Moser-Mercer et al. (1998), in which interpreters were tested to see how long it took for fatigue to set in and when the quality of the interpretation started to decline. Data that was taken included how many errors were made during a 3 minute to 60-minute interpreting time period (Moser-Mercer et al., 1998). Errors increased only after 3 minutes of interpreting. At 30 minutes there was a 15-minute break. When testing began again after the break and between 30 and 33 minutes, only 3 minutes into the interpretation, errors increased. Errors only escalated until the 60 minutes ended the session (Moser-Mercer et al., 1998). Interpreters want to be as accurate as possible and not be antithetical to self-care.

Although people often assume interpreting is exchanging one word in one language to the counterpart in another language, the reality is that this profession forges community and relationships in at least two different cultures at any given time. "Interpreting is more than transposing one language to another...it is throwing a semantic bridge between two people from different cultures and thought worlds" (Namy, 1977, p. 25 as cited by Dean & Pollard, 2005, p. 261). The interpreter must be on guard for these communications and make changes in the interpretation to get the true concept across to the client. Studies show "cognitive load imported from the unfinished processing of the previous segment can be a determinant of the interpreting difficulty of the current segment" (Gile, 2008, p. 1). The literature on simultaneous interpreting shows that early on, cognitive constraints were recognized as one of the most critical limiting factors in simultaneous interpreting performance.

Cognitive load

There is a theory that is connected to the interpreting process called cognitive load theory. Cognitive load is "grounded in the findings of memory research, in particular the cognitive process that occurs during interactions between working memory and long-term memory" (Ayres & Paas, 2012, p. 827). As a profession, there have not been a surfeit of studies done on cognitive load and its effects on signed language interpreting. One researcher stated, "Little research has examined one of the most demanding processes in human cognition, simultaneous interpretation (SI)" (Babcock, 2015, p. 9). Babcock (2015) continues by relaying the difficulty of the interpreting process. An interpreter must listen to the incoming message, understand it, and almost instantly generate the equivalent content in the target language. During the process "cognitive load imported from the unfinished processing of the previous segment can be a determinant of the interpreting difficulty of the current segment" (Gile, 2008, p. 1). Gile (2008) stresses the relationship between cognitive load and difficulties in interpreting.

Interpreters use both the short- and long-term memory during the interpretation process. "Working memory capacity (WMC) is used in managing cognitive demands and regulating emotions. Yet, persistent and intensive demands, such as those experienced during high-stress intervals, may deplete WMC and lead to cognitive failures and emotional disturbances" (Jha et al., 2010, p. 54). Interpreters may wonder how they can keep the overload to a minimum and get control of that cognitive space. "Cognitive control refers to a family of attention-related regulatory processes needed to ensure that information processing is in accord with long- and short-term goals" (Jha et al., 2010, p. 55). By controlling the cognition, there will be more room for the mind to interact with the working memory and connect to the new information coming in.

The stress and cognitive load of simultaneous interpreting has been compared to the tasks of air traffic controllers (Moser-Mercer et al., 1998). When working under such pressure, researchers found this type of prolonged stress was taxing on the heart. "Cardiovascular activity measures point to systematic and increased arousal in simultaneous interpreting producing blood pressure changes that mimic those leading to the development of essential hypertension" (Klonowicz, 1994, p. 222). This process can be detrimental physically if kept up for long periods of time. During interpreting, there is limited cognitive space (brain space) and interpreters may not be able to focus on the task because of negative thoughts and cognitive load. The main problem that must be considered is the fact that this affects how interpreters are able to perform their work.

As previously discussed above, working memory is needed in interpreting to be a holding pen for incoming information. Interpreters hold information in their brain until they have processed it appropriately and are able to produce an equitable interpretation of the source language. This is labeled as cognitive load and often information load contributes to cognitive load. "Information load is the rate at which new information may be introduced and the amount of new information which the language normally incorporates in particular constructions" (Larson, 1984, p. 438). In other words, when a speaker is presenting the message in a normal, conversational manner on a topic that is familiar, the information load would be lighter and easier to interpret. In this case, cognitive load would be manageable.

Additionally, if the speaker is using highly technical terms and speaking rapidly, the information load would be quite heavy and the cognitive load would be running near saturation. In fact, research has shown interpreters often work at the edge of their "processing capacity" (Johnson, 2016). If interpreters are working at their max, sooner rather than later, their work

becomes impaired. "If too much cognitive load is created dealing with complex materials, then learning is compromised because insufficient working memory resources are available to be devoted to the processes required to learn" (Ayres & Paas, 2012, p. 827). The presentation may be highly technical and academic but the audience may be experiencing the subject for the first time. "A well-educated audience will read a heavier text more easily than a newly literate person" (Larson, 1984, p. 440). The cognitive load will be heightened as the interpreter attempts to produce the receptive language to the level the audience can understand.

By the same token, if the interpreter has personal experience or is familiar with a topic by studying it, the load is lightened. "When learners with high levels of prior knowledge learn complex tasks, they experience less cognitive load than learners with less prior knowledge" (Ayres & Paas, 2012). Other research has confirmed this phenomenon. Johnson (2016) describes that cognitive load theory draws on prior experience or knowledge to produce the incoming message, "which then facilitate retention and retrieval of that knowledge from long-term memory and make it possible for the understanding of new related information" (Johnson, 2016, p. 17). By having a broad knowledge base stored in long term memory, an interpreter can quickly pull information that is needed for the interpretation. The fundamentals and mechanics are not the only difficult part of interpreting.

Additionally, interpreters may experience challenges related to external stressors. "Our stress cannot be said to be due solely to external stressors, because psychological stress arises from the interaction between us and the world" (Kabat-Zinn, 1990, p. 368). Some also criticize themselves for not being perfect in a profession where perfection can never be attained. This depletes self-esteem and can begin a downward spiral. This may include berating one's self during interpreting. "When the schemas are activated by an event or series of events, they skew

the information processing system, which then directs attentional resources to negative stimuli and translates a specific experience into a distorted negative interpretation" (Beck, 2008, p. 970). This adds to cognitive load by using up brain space needed for the interpreting process. "The literature on simultaneous interpreting shows that early on, cognitive constraints were recognized as one of the most critical limiting factors in simultaneous interpreting performance" (Gile, 2008, p. 1). The cognitive load will be heightened for the interpreter to produce the receptive language to the level the audience can understand (Larson, 1984). With so much work going on during an interpretation, the mind can become overwhelmed. The literature on simultaneous interpreting shows that early on, cognitive constraints were recognized as one of the most critical limiting factors in simultaneous interpreting performance.

The difficulty of an interpreter's job without proper intervention may cause burnout and desire to leave the profession (McCartney, 2016). "Mental overload may change the interpreter's attitude towards his job, less effort is expended and a certain carelessness sets in" (Moser-Mercer et al., 1998, p. 56). In order for an interpreter to perform successfully, they need to be supported in their performance. If interpreting past one's stamina and capability a reduction in the quality of the interpretation ensues. There is "considerable anecdotal evidence from professional interpreters who will readily admit that, if put in a situation where they have to exceed their personal limits, they just could not care less after a certain time" (Moser-Mercer et al., 1998, p. 56). Interpreters from this study were given a survey to fill out. The interpreter responses from the survey had a propensity to "perceive even objectively controllable situations as uncontrollable and therefore apply non-functional coping strategies" (Moser-Mercer et al., 1998, p. 60). There seems to be an overall need for interpreters to develop coping skills other than giving up or developing apathy when cognitive load becomes overload.

Although a variety of coping skills are utilized, recently an interest has been allocated on focused attention. "Only now are interpreting studies beginning to appear that empirically examine how student interpreters can build the attentional abilities and emotional stability they need to interpret effectively" (Johnson, 2016, p. 9). Being attentional during interpreting can ease the burden of cognitive load by helping build working memory.

Since interpreting can be physically and mentally challenging, in this study, I strive to research the ways mindfulness training (MT) could impact interpreting. Jha et al. (2010) describe that mindfulness is "a prevention tool whose goal is to strengthen capacities that are at risk of being degraded over an interval of persistent demands and potent stressors" (p. 54). The link between mindfulness and the demands and stressors in signed language interpreting is the focus of this study. Mindfulness has proven to be effective in resolving stressful situations in diverse arenas such as, "interpreting high-stakes negotiations, or testimony at a murder trial" (Johnson, 2016, p. 7) and "in unusual or high-pressure contexts, such as emergency, crisis, or military settings" (Mellinger & Hanson, 2020, p. 367). Since mindfulness has proven effective in high-stakes situations, the practice could be advantageous in other interpreting situations as the same cognitive processes are used.

Mindfulness

It is interesting to note, the American Sign Language (ASL) sign for mindfulness is touching your forehead with your pointer finger and while descending down the head and chest, linking both hands by connecting a pointer finger and thumb on each hand, together like a chain. This shows the connection of the mind and body. One definition of mindfulness is published by the Greater Good Science Center at UC Berkeley (n.d.):

mindfulness means maintaining a moment-by-moment awareness of our thoughts,

feelings, bodily sensations, and surrounding environment, through a gentle, nurturing

lens. Mindfulness also involves acceptance, meaning that we pay attention to our

thoughts and feelings without judging them—without believing, for instance, that there's

a "right" or "wrong" way to think or feel in a given moment. When we practice

mindfulness, our thoughts tune into what we're sensing in the present moment rather than

rehashing the past or imagining the future. (p. 1)

This definition describes how mindfulness focuses on letting go of judgement, and being in the

present moment. For interpreters who process high amounts of incoming information,

mindfulness could be one way to manage that information.

Although there is little information about mindfulness practice in connection with signed

language interpreting, the practice itself has existed for thousands of years. "When people think

of meditation and mindfulness, they think of the Buddhist religion that has been around for 2500

years" (Vago & Silbersweig, 2012, p.1). Western culture has adopted a more recent modified

mindfulness practice for relief of stress and chronic illness. According to Vago and Silbersweig

(2012), Jon Kabat-Zinn orchestrated the first mindfulness based medical center about 25 years

ago. While at the center, Kabat-Zinn adapted techniques he learned from the Buddhist religion to

control chronic pain and stress reduction and created the Mindfulness-Based Stress Reduction

(MBSR) course (Vago & Silbersweig, 2012). This program was so effective and showed so

much promise that soon mindfulness practice became popular nationwide. Mindfulness Training

(MT) "is now widely available, with more than 250 medical centers around the United States"

(Jha et al., 2010, p. 54). In the past few decades, studies have increased touting the many benefits

in health and wellness by incorporating such a regimen into daily life. "Sages have long

advocated the value of cultivating an ability to mindfully focus on the here and now, and

converging scientific evidence has begun to corroborate this view" (Mrazek, Smallwood, &

Schooler, 2012, p. 2). The Western World has embraced and modified mindfulness practice

because of the many advantages for the mental and physical relief from the stressors of our fast-

paced world. From a study done by Mrazek et al. (2013), they concluded:

> mindfulness-based practices have broadly been found to have several benefits including,
>
> but not limited to, reducing stress, anxiety, and depression, and enhancing attentional
>
> focus, working memory capacity, cognitive flexibility, positive mood, resilience, immune
>
> functioning, interpersonal relationships, and well-being. (p. 2)

A benefit of the practice is mindfulness helps to clear the mind of clutter of past and future

worries by mentally and physically being present in the moment without judging anything.

Furthermore, mindfulness can be broken down into two parts. "The first is awareness:

focusing on the present moment, concentrating on whatever you happen to be doing in that

moment. The second is being aware of your experience without judging it" (Van Dijk, 2013, p.

68). An easy way to understand mindfulness is like trying to put shoes on in a phone booth. It is

crowded, frustrating, and difficult to manage. Williams, Teasdale, Segal, and Kabat-Zinn (2007)

describe that mindfulness aims "to approach our minds and bodies with a sense of curiosity,

openness, and acceptance so that we may see what is here to be discovered and be with it without

so much struggling" (p. 95). If the person trying to tie their shoes goes into their bedroom, they

will find there is a lot of space, and they can calmly and easily put their shoes on (Chambers,

2019).

Since mindfulness has been so widely accepted for treating chronic pain, mental focus,

and overall wellness, other professionals have begun implementing mindfulness practices in their

businesses. Many corporations and professions have adopted this calming practice to combat

various mental and physical illnesses (Burnett, 2011). Psychologists and therapists have been

using mindfulness in their practice for several years. Van Dijk (2013), a Dialectical Behavioral

Therapist who teaches mindfulness to clients, comments that formal mindfulness practice can

help clients "become more aware of their internal experiences, increasing self-awareness, and the

ability to manage themselves more effectively" (p. 95). When individuals are able to control

negative thoughts, which cause higher stress levels, experiences in life can improve. "The more

tuned in you are to your direct experience of life (rather than to your mind's running

commentary) the more empowered you are to take your life in the direction you truly want"

(Harris, 2008, p. 49). The ability to develop coping skills for everyday life has been enticing to

individuals personally and professionally.

Not only professionals can employ these practices for success, students also have

benefitted from mindfulness. One researcher reported about the success of test takers using

mindfulness techniques before a test as compared to those who had no mindfulness practice:

"The qualitative data suggest that this difference may be attributable to the greater present-focus

awareness, self-compassion, acceptance, and self-regulation of attention and emotion that

mindfulness-group participants had developed" (Johnson, 2016, p. iv). Findings showed greater

"present-focus" benefited test takers who had used mindfulness techniques before a test as

compared to those who had no mindfulness practice (Johnson, 2016). Further, when interpreting

students practiced focused mindfulness before testing, the individuals outperformed those who

did relaxation meditation or simply started the test (Johnson, 2016). The focused mindfulness

had a more positive effect on test taking than just relaxation.

Since close examination submits the benefits of focused attention, the interpreting profession may well benefit from these studies. During the interpreting process, the mind is attending to many different tasks. Since interpreters must manage cognitive load, employing a mindfulness practice before an interpreting assignment would be advantageous (Mrazek et al., 2012). Not only would mindfulness help interpreters focus during the interpreting assignment, but there are added benefits for the interpreter as well, such as lower levels of stress. Additionally, besides stress reduction, advantages would include a reduction in "mental or physical fatigue, empathy enhancement, expanded awareness of interpreting users' needs, [and] the possibility of improving managing interaction or dealing with conflicting objectives of dialogue interpreting participants" (Ivars & Calatayud, 2013, p. 18). Mindfulness can help interpreters personally and professionally.

In terms of applying mindfulness to interpreting, being able to focus more on the present moment and less on past and future worries and concerns could reduce cognitive load and the interpreter would have more brain capacity to focus on the presentation to make better interpreting choices. Trying to juggle so many mind gymnastics all at one time can cause one to become fatigued and lose the ability to focus and perform optimally. Johnson (2016) surmises: "mindfulness training appears to help interpreting students optimize their learning and performance by strengthening their self-regulation of attention and emotion and thereby reducing the extraneous load of internal distractors such as mind-wandering, self-criticism, and nerves" (p. iv). Johnson's (2016) research reifies that an interpreter's job is difficult enough without adding to the cognitive load with unhelpful mental claver.

One way signed language interpreters process incoming information is by relying on messages held in the brain by memory until the concept can be finally produced on their hands.

"Cognitive control refers to a family of attention-related regulatory processes needed to ensure that information processing is in accord with long- and short-term goals" (Jha et al., 2010, p. 55). Practicing focused mindfulness can allow interpreters to explore a positive practice to help function at an optimal level. Interpreters, because of lack of attention "find themselves in a situation where they have understood a source-speech segment but have 'forgotten' it by the time they are about to reformulate it in the target speech" (Gile, 2008, p. 3). An interpreter is often in the middle of interpreting one sentence when another sentence has already begun. Unless the interpreter has used prediction skills accurately, the interpreter will still require working memory for the incoming message to "decide how to reformulate it in the target language or utter its target-language version while monitoring his/her own output. These tasks which come on top of the processing of the new sentence produce 'imported cognitive load'" (Gile, 2008, p. 5). Since the brain is often working at saturation as explained previously, there is little room for ineffective thoughts while interpreting.

It is interesting to note that mindfulness is being researched more thoroughly because of the many positive results. "Enhanced attentional focus may be key to unlocking skills that were, until recently, viewed as immutable" (Mrazek et al., 2012). I had become curious about mindfulness in my personal life and found research that showed a promising benefit in my professional life (Johnson, 2016). Yet, to date I have only found two papers about mindfulness and the effects on spoken language interpreting (Johnson, 2016; Ivars & Calatayud, 2013). Therefore, in this project, I will examine the relationship between interpreting and mindfulness.

Chapter 3: Methodology

The blueprint of this study is based on an analysis of the relationship between mindfulness practice and cognitive load correlation. In this research, the effect of mindfulness on cognitive load during signed language interpreting will be tested on one subject. The study will be done in the K-12 high school setting while signed language interpreting for one student in five different classes.

Naturalistic and qualitative methods connected best with data collecting as I studied the effects of mindfulness upon cognitive load in my interpreting work. I generated and tested the hypothesis that these theories and methods will inform my practice. By using four different surveys, journaling, and charting blood pressure, I determined if mindfulness would help me to focus on the moment by reducing cognitive load. With more attention placed on the here and now, my findings will show whether or not my interpretation was given in a calm, focused manner because there was less cognitive load. In other professions, mindfulness practice has included benefits for practitioners such as "reducing stress, anxiety, and depression, and enhancing attentional focus, working memory capacity, cognitive flexibility, positive mood, resilience, immune functioning, interpersonal relationships, and well-being" (Nadler et al., 2020, p. 2). Researchers such as Virgili (2015) are interested in the application of mindfulness-based interventions in relation to stress management in occupations that are high in stress. The hypothesis being tested was that since interpreting is a complex process, mindfulness-based interventions can help reduce an interpreter's cognitive load.

Population and/or Sample

I am researching the effects of mindfulness on my signed language interpreting cognitive load and did not study a large demographic or diverse population. Since this is a personal study,

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the data will not be overarching like it would be if multiple signed language interpreters were studied. My opinions and self-reflections are very much connected to my data. I will be using cognitive therapy questions to assess my state of being. Also, since I am a K-12 signed language interpreter, all of my samples will be contained in the K-12 classroom. Although course topics will change throughout the day, I will still be in the high school setting.

Mindfulness Based Stress Reduction Course

I enrolled in a 9-week mindfulness-based course. The course was taught by Janet Dietrich, MD, who is a qualified Mindfulness Based Stress Reduction (MBSR) teacher trained through the Center for Mindfulness at the University of Massachusetts. The course was developed by Jon Kabat-Zinn, who is known globally for his work as a scientist, author, meditation teacher, and creator of the mindfulness program instituted in hospitals worldwide for the management of chronic pain (Vago & Silbersweig, 2012).

The class began September 11, 2019, and ended November 6, 2019, with one day (Saturday, October 23rd) included as a retreat. Classes were held weekly on Wednesday evenings from 6:00 p.m. to 8:30 p.m. During the two-and-a-half hour classes, I was instructed on and practiced a progression of four specific formal mindfulness meditations. The practice was designed to connect the mind to the body while staying in the present moment. One requirement of the 9-week program was to practice 45 to 60 minutes, six days a week.

I was also given information for informal practices. These practices included noting situations in a journal when I had more self-compassion with myself than I had previous to taking this class. I was to try to incorporate eating a meal using mindfulness. I was to consider the times I noticed mindfulness in my life without intentionally bringing it up. The last informal practice encouraged taking a daily, routine activity, such as brushing teeth, and to perform it

mindfully. Although we had personal instruction during class time, the home practice consisted of audio recordings from the MBSR program. The recordings included 39 to 46 minutes of either a body scan, sitting meditation, lying down yoga, or standing yoga.

The first class introduced a body scan meditation where I was in a supine position on a yoga mat and focused on one body part at a time, beginning at the toes and ending at the top of the head. Focused breathing was encouraged. This practice took 39 minutes. This practice was done for the first two weeks of the program. The next meditation that was introduced was a lying down yoga practice which took 43 minutes. This consisted of incorporating yoga moves while lying supine on the yoga mat. The yoga moves were based on Hatha yoga. Week three and four practices were alternating the body scan with the lying down yoga.

The third meditation practice I learned was a 44-minute sitting meditation. I sat in a chair or in the astronaut position with my back on the ground and legs at a 90-degree angle, while focusing on breathing and different sensations of the body. This was practiced alternating with the standing yoga series for weeks five and six. The fourth practice was a standing up yoga series with moves and stretches performed while upright. This practice was 46 minutes long. I was to alternate the sitting yoga with the standing or lying down yoga for our next week practice.

From the first few weeks, I was encouraged to find daily chores I did mindlessly and try to be present, slow down, and feel the sensations that came with that activity. In class, I practiced eating mindfully while eating a raisin. I felt the wrinkles and shape of the raisin and noticed the color and smell. Finally, I put it in my mouth to feel the texture and slowly began to taste it. I was then asked to take this practice home and use this technique while eating my meals. I was also taught how to walk mindfully by focusing on each step. I did not have to walk far, in fact just around the room, but I had to notice how my feet worked and how my body balanced. I was

taught how to breathe mindfully and to come back to the breath if thoughts arose during the session. Thoughts were not considered bad but I was to note they were there and come back to the focus of the breath.

Week seven included the retreat where I performed all the practices I had learned. This day started at 8:30 a.m. and went until 3:30 p.m. The last two weeks I was asked to start reducing the time spent with the audio practice and begin to listen to my body and mind and practice what they were telling me I needed. I was to still practice 45 minutes a day, but the choice was mine to make on how this time was used.

Data Collection

I documented the formal mindfulness study by filling out four different surveys, taking blood pressure and heart rate (pulse) before and after MBSR class, and recording thoughts in a personal journal. I wanted qualitative and quantitative data to study if there were any added benefits or frequency of success in reducing cognitive load during signed language interpreting by taking this weekly course.

In order to collect evidence for or against the positive qualities of the mindfulness course, I chose surveys. Although the questions required my personal qualitative answers, there was a numerical tally. I was able to use the quantitative data to explicitly show an increase or decrease of emotions and mindfulness. Once a month, beginning on August 22, 2019, which is the first day of school for students, I filled out surveys for anxiety, stress, depression, and mindfulness (see Appendices A, B, C, and D). I filled out the surveys four times during a five months period. This scale provided records of physical and emotional behaviors on a variety of scales.

Data was taken by using four different test survey: Generalized Anxiety Disorder (GAD-7), Perceived Stress Scale (PSS), Patient Health Questionnaire (PHQ-9), and Cognitive and Affective Mindfulness Scale (CAMS-R) (see Appendices A, B, C, and D). The first three survey forms were chosen from cognitive behavior therapy as they had the best connection to anxiety, stress, and depression, which seemed to be the biggest distractors in my signed language interpreting production.

The GAD-R was chosen as anxiety is a main focus of this research because of the impact on cognitive load. There are only seven questions in this survey, and they focused on how often a situation has become bothersome. One question asks about, "Not being able to control or stop worrying" (Spitzer, Kroenke, Williams, & Lowe, 2006, n.p.). The answer options are Not at all sure = 0, Several days =1, Over half the days = 2, and Nearly every day = 3. The questions determined a person's ability to accomplish normal, daily life goals. After adding the totals, the higher the score, the less ability there was to function in a daily routine. Ceaseless worrying takes up cognitive space needed for daily life, and therefore, this is the reason this survey was selected for interpreters.

The PSS was chosen because the study relied on testing stress levels in signed language interpreting performance. Since stress adds to cognitive load, this survey takes into account feelings and thoughts. There are ten questions asked and five options for answers. One sampling of the questions was: "In the last month, how often have you found that you could not cope with all the things that you had to do?" (Cohen, 1994, p. 5). Answers included 0 = Never, 1 = Almost Never, 2 = Sometimes, 3 = Fairly Often, and 4 = Very Often. The higher the number, the higher the stress level influencing coping skills.

The PHQ-9 was used by a medical clinic to assess the level of depression which can influence energy and quality of life. This scale asks nine questions including, "Feeling bad about yourself or that you are a failure or have let yourself or your family down" and "Trouble concentrating on things, such as reading the newspaper or watching television" (Spitzer, Williams, & Kroenke, 1999, n.p.). There are four possible answers: Not at all = 0, Several days = 1, More than half the days = 2, and Nearly every day = 3. Scoring was determined by 1-4 being minimal depression, 5-9 mild depression, 10-14 moderate depression, 15-19 moderately severe depression, and 20-27 was severe depression.

I chose the Mindfulness (CAMS-R) survey when I had read about it when researchers used it for their study about mindfulness in the school setting (Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007). There are 10 questions asked in the survey. For example, "It is easy for me to concentrate on what I am doing" (Feldman et al., 2007, n.p.). There are four options to choose from: Rarely/Not at All, Sometimes, Often, or Almost Always. There are numbers associated with the choices. Rarely is one point, sometimes is two points, often is three points, and almost always is worth four points. High numbers mirror a more mindful attitude.

I chose to take my blood pressure and heart rate before and after MBSR classes to challenge the hypothesis that mindfulness will have a calming effect from the mind to the body. I used the electronic Microlife blood pressure/heart rate machine. Again, blood pressure and heart rate numbers were quantitative data for this study which would show more conclusively benefits of mindfulness rather than relying solely on qualitative data. Blood pressure and heart rate can show an elevated or aroused state of being. It can also show the body in a more peaceful, calm state. Because my blood pressure and heart rates were not abnormal, this test would be an informative part of my study.

I took notes in a journal about the times I felt anxious or stressed during interpreting. I planned to have it in my lap as I interpreted to note when I felt anxious and whether I ignored the anxiety or took a deep breath to refocus using mindfulness. If I was anxious, I would write the antecedent and behavior chosen to resolve the issue. I would note the effect this action had on my cognitive load and the resulting interpretation. Journaling in itself will produce a mindful mindset and help the practice to solidify in my work.

Data Analysis

To analyze the data, different approaches were used depending on the data type. For the journal, I planned to tally the number of times mindfulness was used versus the number of times it was not used. Additionally, I took my blood pressure and heart rate before and after the mindfulness classes I was attending. I drove five minutes to class, and class was two and half hours long once a week. Afterwards, I drove home, where I would take my blood pressure and heart rate. I made sure to use the same electronic blood pressure cuff, the Microlife cuff. To analyze the blood pressure and heart rate data, I created a chart to compare my blood pressure and heart rate before and after the course.

The results of the survey data, blood pressure, and heart rate data, were plotted on graphs. At the end of the five-month trial, reports showed increase or decrease in anxiety, depression, stress, mindfulness, blood pressure and heart rate.

Chapter 4: Results and Discussion

The MBSR program connected perfectly to my action research as it provided education and practice about mindfulness and stress reduction. The timing worked out well as I interpreted three weeks without any formal mindfulness training. My hypothesis predicted a change in interpreting anxiety as the class progressed, so I had a base to compare differences in interpreting without mindfulness practice and later, with mindfulness practice.

The results of this study may be summarized by stating formal mindfulness training has measured enough of a reduction of cognitive load while interpreting to be a credible practice for the signed language interpreter. The decrease was also part of personal motivation to reduce anxiety and stress during interpreting sessions. My findings support the original purpose of the study which was by managing cognitive load with focused attention due to mindfulness. The interpreter can have calmness and the ability to produce a more intelligible interpretation with less stress and anxiety. Mindfulness proved to enhance self-compassion which lessened the cognitive load by ridding the mind of self-defeating thoughts.

Survey Data

During the testing period of September 11, 2019, through November 6, 2019, stress remained high; however, anxiety and depression dipped at the end of September and through October. When I stopped the daily formal practice in November, stress, anxiety, and depression all rose. However, mindfulness awareness consistently rose throughout the testing period.

Scoring for the Anxiety (GAD-7) test demonstrated that anxiety was severe with a score of 16 when the first survey was taken (see Figure 1). MBSR class began September 11th and when the second survey was taken, anxiety decreased to mild at 9 points. MBSR class ended on

November 6th and the third survey taken one month after mindfulness class was over showed an

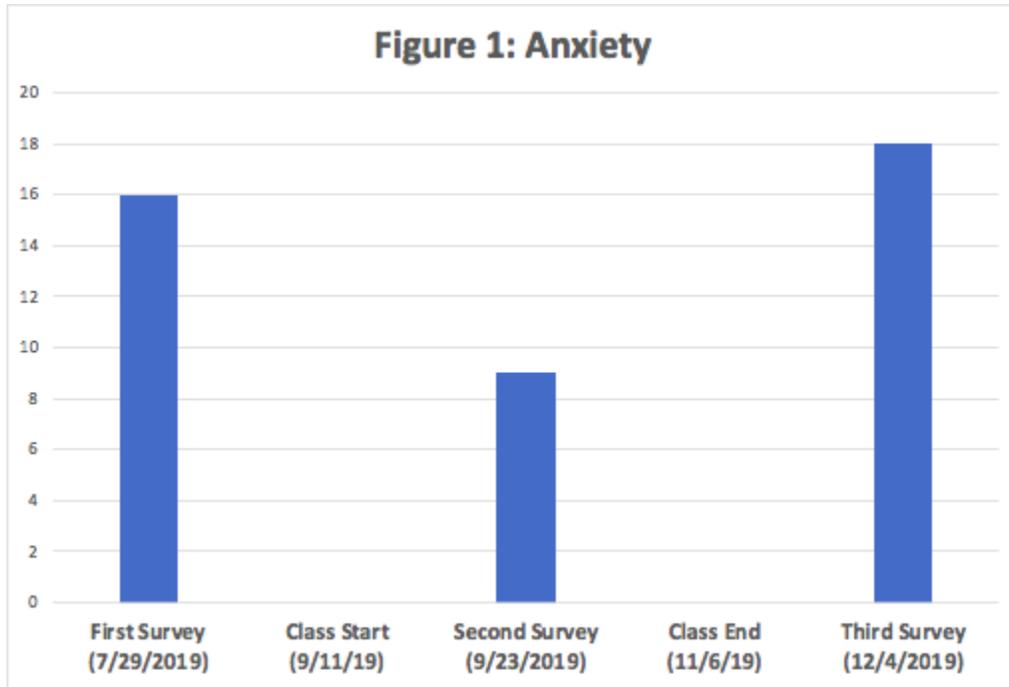increase of 9 points bringing the anxiety level back up to severe.

Figure 1. The chart illustrates the results of the GAD-7 survey data collected to track anxiety.
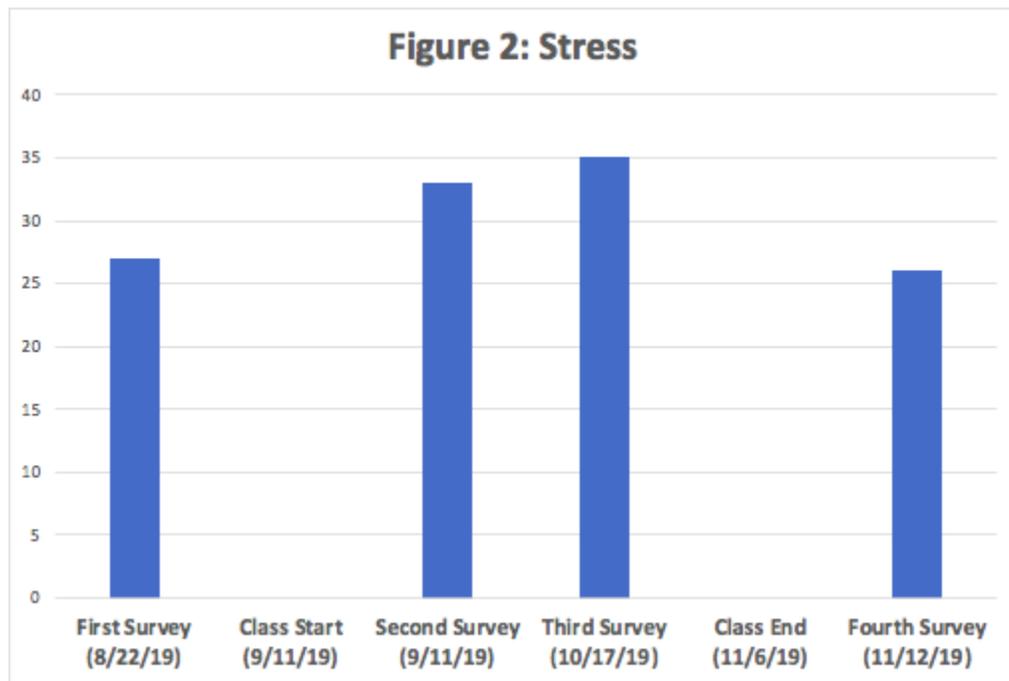

Figure 2. The chart displays the results of the PSS survey, measuring stress levels.

Scoring on the Stress (PSS) test showed stress levels remained high and actually increased until the last test in December and dropped one point to moderate stress (see Figure 2). During the time of MBSR class, two surveys were taken, both of which showed an increase in stress level to a high of 35. One week after class ended, stress levels declined 9 points.
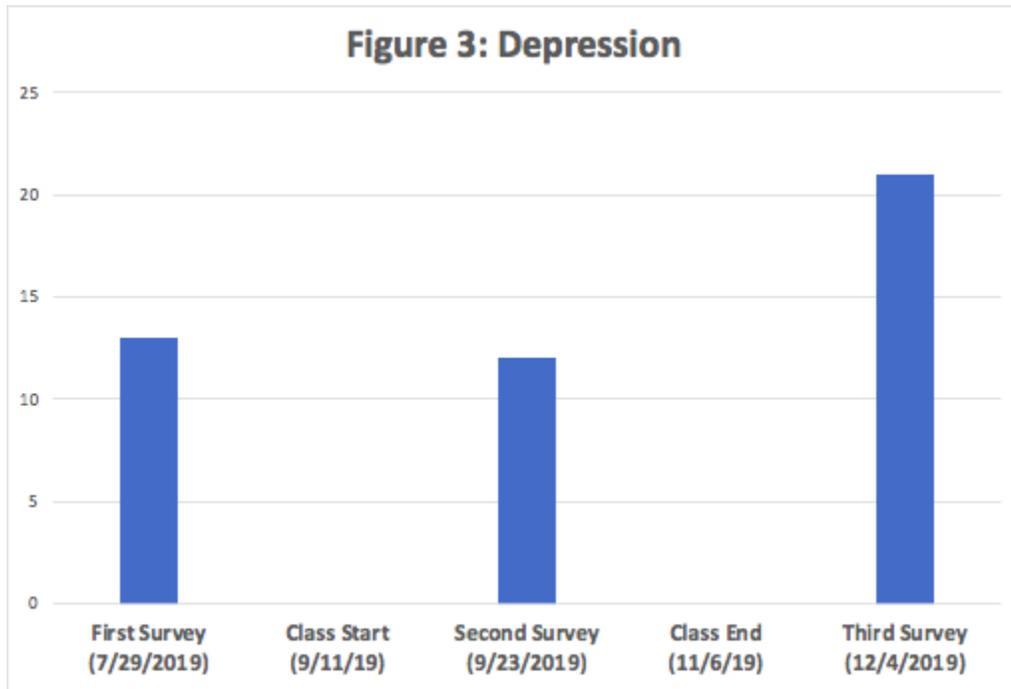

Figure 3: Depression

Figure 3. This chart demonstrates the scores of the PHQ-9 survey for depression.

Scoring for the PHQ-9 test for depression went from moderate to slightly less moderate by dropping one point, and ended in severe over the data collecting time (see Figure 3). The first survey showed depression was at a moderate level at 13 before MBSR class started. One survey was taken during the middle of the MBSR course session and dipped one point to 12. The third survey was taken after MBSR was over and the score elevated 9 points to 21.

Scoring for the CAMS-R scale for mindfulness showed improvement by 10 points over the course of this research (see Figure 4). The first survey taken before the MBSR class was 16. Two surveys were taken during the class which showed an elevation of 17 and 18. The last

survey taken one week after MBSR ended, showed an improvement in mindfulness by 8 points leaving the total at 26.
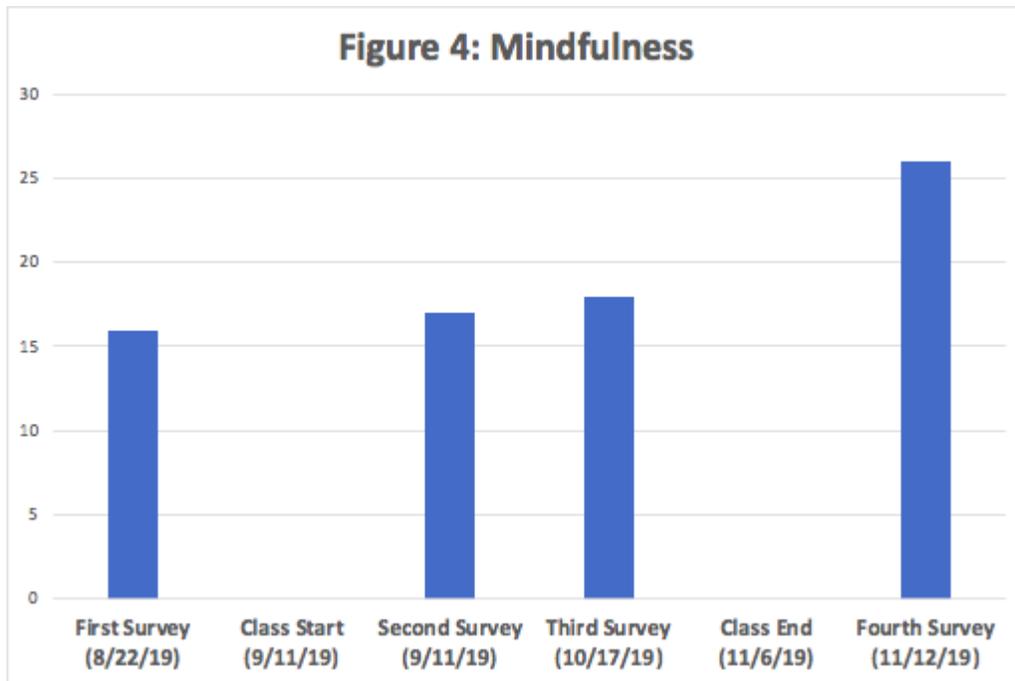

Figure 4. The chart displays the results of the CAMS-R mindfulness scale.

The results of the surveys showed that through mindfulness, I was reducing anxiety and depression as mindfulness was going up (see Figure 4). In terms of my interpreting, this meant that I was able to focus more clearly on the act of interpreting. Instead of ruminating on my mistakes or worries of the past and future, I was able to set them aside and focus on the teacher lecture as my cognitive load was lessened. These findings supported my hypothesis in that my anxiety was reduced as I practiced mindfulness; however, stress remained high throughout the mindfulness course.

Blood Pressure and Heart Rate Data

Out of the nine test days, blood pressure was lower after MBSR class six times (see Table 1). Also, blood pressure was higher after class two times out of the nine attempts. On October 26th, the day of the retreat, I did not have time to check my blood pressure as I had an obligation

that prevented me from doing so. Since the instructor told us to be careful driving because we were so relaxed, my theory is that my blood pressure would have been lower after the class than before class.

Table 1

MBSR Class Blood Pressure Chart

DATE	BEFORE CLASS BLOOD PRESSURE	AFTER CLASS BLOOD PRESSURE
9-18-19	143/72	125/79
9-25-19	126/72	144/76
10-2-19	127/79	147/74
10-9-19	118/72	116/78
10-16-19	148/72	136/80
10-23-19	150/73	135/75
10-26-19	132/67	no data
10-30-19	153/78	135/60
11-6-19	132/76	120/73

Note. Classes were Wednesday nights from 6:00 p.m. - 8:30 p.m. with a retreat on Saturday (10-23) from 8:30 a.m. – 3:30 p. m.

The Heart Rate table showed a decrease of 6 out of 9 times after class (see Table 2). There were two days where the heart rate stayed the same and one day that heart rate was not taken after class.

Table 2

Heart Rate (Pulse) Table

DATE	BEFORE CLASS HEART RATE	AFTER CLASS HEART RATE
9-18-19	71	61
9-25-19	68	58
10-2-19	72	60
10-9-19	72	61
10-16-19	66	66
10-23-19	67	66
10-26-19	59	no data
10-30-19	65	65
11-6-19	71	60

Note. Classes were Wednesday nights from 6:00 p.m. - 8:30 p.m. with a retreat on Saturday (10-23) from 8:30 a.m. – 3:30 p. m.

Blood pressure shows if heart rate is elevated and how hard the heart is working. Worry and anxiety come from thinking about the future and uncertainty but mindfulness allows participants to be in the present moment. My hypothesis was that after mindfulness class, my

heart rate would have been calmer and gone down because the classes were intended to be calming and allowed us to practice focused mindfulness. When I felt stressed and anxious, my heart rate would go up. The blood pressure data showed that six out nine times my blood pressure was lower after class than before class. This drop in blood pressure demonstrated that mindfulness was helping me to relieve the stress and anxiety that contributed to an elevated blood pressure. This data further supports that mindfulness practices helped me reduce stress and anxiety which contributed to a calmer demeanor and allowed me to be more focused and reduced my cognitive load. These changes allowed me to make better decisions as an interpreter, therefore improving my overall job performance.

Journaling Data

Although I had intended journaling to play a major role in my research, I found it to be merely a tool for releasing daily stress. My original plan was to have a journal on my lap and when anxiety came up and I used mindfulness, I would write it down. I quickly found having a notebook on my lap was bothersome and it often fell from my lap. I really did not have time during interpreting to write as there was not a lot of down time during class. We had a five-minute passing period before the next class and I had to travel to another school during lunch. I did have a prep period in the afternoon but by the time I sat down to write, I rarely remembered the issue. I decided early on that journaling at work was not effective but continued to write regularly in my journal about my day in the evening.

On September 30th, I had written I felt more level headed. I stated I was more in-tune with my body and its sensations. On October 4th, I had written mindfulness practice made me depressed. It reminded me of a quote, "Mindfulness may cause them to look inside themselves

and, it may not be a safe or comfortable place for them" (Van Dijk, 2013, p. 69). At times, I also had feelings of irritation, impatience, energy, restlessness, boredom, and neutrality.

As I continued to read in my journal, I realized college had started again and I was feeling overwhelmed. I also wrote that "My mind was like a chessboard and the pieces were thoughts. Sometimes they can be anxious thoughts or fighting against each other like a bad person trying to be kind. But the board stays whole. The pieces don't threaten or break the board. It's okay, the pieces won't break the board." I had learned in MBSR that I am the sky and everything else is just the weather. These types of thoughts were to counteract my negative or anxious thoughts.

Discussion

The MBSR program connected perfectly to my action research as it provided education and practice about mindfulness and stress reduction. The timing worked out well as I interpreted three weeks without any formal mindfulness training. My hypothesis predicted a change in interpreting anxiety as the Mindfulness class progressed, so I had a base to compare differences in interpreting without mindfulness practice and later, with mindfulness practice. Finding ways to reduce anxiety and increase mindfulness is important for interpreters as anxiety and self-deprecating thoughts can impact their job performance. As interpreters are tasked with a job that requires their brains to work at near saturation at all times, they need tools to ensure they are doing their job effectively. These tools were missing for me, and might also be missing for other interpreters. The data I collected shows that mindfulness served as a tool for me.

Although the data collection I intended to do for the journals did not go as planned, I still found the journals to be a useful tool in this process. As I reread my journal, I found I used it as a releasing tool for the pressures of the day. I noticed I often wrote about the difficulties of my life

after school but during school seemed to be my peaceful place. I believe the early morning daily practice of mindfulness was calming me down and reminding me to breathe deeply and focus on my job. I also began to notice that I was not as anxious in the interpreting chair as I thought I would be at the onset of this study. As stated above, mindfulness practice helped reduce anxiety and stress (Nadler et al., 2020). This was clear to me as I was journaling, I realized I was not writing about the stressors of my signed language performance and what I wrote was helping to release pressures of personal life.

While evaluating the charts, anxiety (Figure 1) started moderately high at sixteen points, but during the nine-week MBSR course decreased by seven points. However, one month after the course was over, and I had stopped the daily practice, anxiety increased by nine points. Stress (Figure 2) remained high and actually peaked during the MBSR class. My hypothesis for the spike is my personal life was already overwhelming and by adding a two-and-a-half-hour block in the evening to my schedule, this caused an increase in my stress threshold.

Depression (Figure 3) showed a slight one-point decrease during the weeks of class and then an increase after the nine-week session was over. The decrease occurred when I was taking the class and participating in mindfulness practices daily, but the increase occurred afterwards when I stopped the daily mindfulness practice. This shows that the class was important to me by significantly lowering anxiety and slightly lowering depression.

Mindfulness (Figure 4) showed a consistent increase during the course of MBSR and even after the program ended. My reasoning for the increase in the mindfulness practice was the practice was allowing me to give more attention to one task at a time. Figures 5 and 6 showed a decrease in blood pressure and heart rate after the MBSR class experience six out of the nine classes. October 23rd was the retreat which was all day mindfulness practice. Had I been able to

take data after that class, my hypothesis was my blood pressure and heart rate would have been lower. The research was about interpreting, but the surveys asked me to look at the last month in general, including my personal life. If I had focused on responding to the questions as they applied only to my working hours, I wonder if this would have made a difference in the results.

Overall, I realized mindfulness is about focusing thoughts on the present moment. In my interpreting work, I was able to drop the negative criticism of my work during the interpretation, which left brain capacity to focus on the incoming message. The link between anxiety and signed language interpreting was assisted by using the mindfulness practice. This research has proven beneficial due to the fact that mindfulness has not been researched in connection with signed language interpreting and cognitive load before. Signed language interpreters now have another stepping stone to experiment with on their personal path to gaining expertise in this profession. This research taught me that seemingly small details I had overlooked, such as keeping my interpreting data separate from my personal life, could have made a difference in my research results. Although mindfulness practice may not have been the total panacea I was hoping for, mindfulness definitely made a difference in the way I cognitively approach my signed language interpretation.

Chapter 5: Summary, Conclusions, and Recommendations

Based on my findings, the greatest benefit was the focus I was able to maintain during interpreting itself. I felt calmer and more confident in the interpreting chair than I had before and I was able to dismiss, for the most part, the negative chatter that took up so much of my brain capacity, therefore, lessening cognitive load. I found I had more compassion towards myself as a signed language interpreter than I had before I studied mindfulness. Because of the consistent brow-beating and negative commentary I had normally bombarded myself with, I believe my cognitive load lightened, and I was able to calmly focus on the job at hand.

Other Factors

While working with my mentor dissecting a videotape of my interpretation of a lecture, the mentor commented how calm I looked while interpreting. This was a new impression of myself I had never considered possible. The video showed less facial processing, which can be a by-product of cognitive load. The result was a more fluid interpretation. I had planned to take data each time I was feeling anxious while interpreting in a class, but I found I was not able to write during interpreting. In addition, I was not feeling the anxiety during interpreting as I had expected. I did, however, find a difference in my first few videos I sent into my college class as compared to the last few videos I sent in 12 weeks later. As mentors pointed out, I seemed very calm and comfortable while interpreting a difficult psychology class.

Because of my busy schedule, I had to replace exercise with the mindfulness practice. Soon into the MBSR program, I had written of the concern of not having a physical exercise program. I am not sure if that was my anxiety about having a change in my schedule or if not exercising was affecting my physical health. I had written September 29th at 3:30 am, that I had

done a body scan in bed and when I got out of bed had done aerobics. That day I had a lot of energy.

Recommendations

While my hypothesis was generally supported, there is still much research to be done on this topic. One thing I would possibly change, given the opportunity, would be to increase the survey frequency. I also would have liked to have found a way to make the journal more effective to collect emotional and mindfulness data. The way I planned to use the journal was ineffective because it disrupted my interpreting. Ideally, in future studies, the researcher would find ways to collect emotional and mindfulness data in a way that did not interrupt the interpreting process.

I would also recommend balancing exercise with mindfulness, even if it was only 30 minutes of exercise and mindfulness instead of 45 to 60 minutes of each. I believe that having a focused mind and a healthy body will help longevity in the interpreting field. I would be more flexible than rigid with myself and the program. I feel the greatest benefit was the focus I was able to feel during interpreting itself. I felt calmer and more confident in the interpreting chair than I had before, and I was able to dismiss, for the most part, the negative chatter that took up so much of my mind, therefore, lessening cognitive load. I would highly recommend continuing a daily formal practice of mindfulness to receive the best benefit.

Studies have shown mindfulness practice can ignite compassion towards oneself and others. "Empathy can become an essential ability to thoroughly understand the speaker's words or intentions, in Seleskovitch and Lederer's (1986:256) words le vouloir dire" (Ivars & Calatayud, 2003, p. 13). Developing empathy could yield greater rapport between individuals and create an overall satisfactory interpreting encounter. Researching the "benefits of

mindfulness training to enhance both the listening and understanding phase of the language transfer process" (Ivars & Calatayud, 2003, p. 13) would be a worthy endeavor for the interpreting field. Further examining empathy and mindfulness as they relate to interpreters could be an opportunity for research in this area of study.

While researching ways to reduce the anxiety during testing, I read an article about test taking and mindfulness. Reading this article made me curious about mindfulness in my personal life, and I found research that showed a promising benefit in my professional life (Johnson, 2016). I have researched the benefits of mindfulness in other professions and for spoken language interpreters, but I am a signed language interpreter. Since there is not a plethora of research connecting signed language with mindfulness, there is a gap that needs to be filled. Further, as my findings have shown positive outcomes for mindfulness practice, other interpreters could test my research for themselves to see if it is a workable practice tool in their own interpreting performance. Overall, research on this topic is limited and worthy of further consideration.

Conclusions

I often wondered why I was able to adapt so quickly to mindfulness at work and not so at home. When I started the study, I was sure interpreting caused anxiety and stress and that negative self-talk was the root of it. Because my mind was full of criticism of myself and my work, there was little room for the teacher's lecture to be processed as the cognitive load was already near capacity. Whether I was maturing as an interpreter or just knew my skill level was where it was, I began to let go of the negative thoughts during my work. As I look back, I can see in my video work samples a calmer demeanor towards the end of the research as compared with the beginning.

It was curious to me why this calmness did not carry over into my life when I was not at work. I began to think about the differences of home and work life. As a beginning mindfulness practitioner, the best place to start is in a quiet place where no one comes in. Although the K-12 setting is not a quiet place necessarily, it is a place I know well by working in that setting for over two decades. Therefore, it was not necessarily stressful for me. Also, my student was hard of hearing, oral, and focused on the teacher; thus, the student's attention was not on the interpretation. Although my interpretation and growth were important to me, my student did not rely on my signs for the lessons. The mindfulness practice had a fertile place to grow. I did not want to think about the stressors at home so it was easy to say "I am working. This is my job. Focus on the interpretation."

Being a novice mindfulness practitioner was more difficult at home because life was so stressful. It was not easy to stop and breathe because too many obligations needing my attention did not allow the time. As I am reviewing and writing the final draft of this action research project, I have come to realize that mindfulness is indeed helping in my personal life, I was just expecting perfection before the practice could begin its change in me.

As an interpreter seeking ways to always improve, this project also taught me how to take a problem that was holding me back professionally, research a possible tool to help resolve the issue, and as the subject, experiment and find out for myself if my hypothesis was viable or not. This project taught me how to write, be a researcher, ask questions, and how to understand the results of the data. This project will have lifelong impact in my future, and hopefully, for other interpreters who read this research. Since there was a gap in research on the topic of sign language interpreting and mindfulness, this project can act as a resource for other interpreters searching for ways to improve their skills and lessen cognitive load by practicing mindfulness.

Overall, this project taught me that it is possible to change my thinking process by using daily mindfulness practice. The biggest difference in my cognitive load and interpreting process showed less negative chatter taking up space in my brain when I was doing the daily 45-minute practice before going to work. When I stopped doing the practice daily, I was still receiving benefits from mindfulness in my interpreting performance by focusing on the lecture I was interpreting without worrying about ruminations of a negative performance. Through the process of conducting this research, I found that mindfulness proved to have a benefit in reducing cognitive load during interpreting.

References

Ayres, P., & Paas, F. (2012). Cognitive load theory: New directions and challenges. *Applied Psychology, 26*, 827-832. DOI: 10.1002/acp.2882.

Babcock, L. (2015). *The neurocognitive fingerprint of simultaneous interpretation* (Doctoral Dissertation). Retrieved from https://iris.sissa.it/retrieve/handle/20.500.11767/3895/1583/1963_34447_Dissertation-Laura%20Babcock-final.pdf

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191-215.

Bandura, A. (2006). Guide for constructing self-efficacy skills. In F. Pajares and T.S. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 307-337). Greenwich, CT: Information Age Publishing.

Beck, A. T. (2008). The evolution of the cognitive model of depression and its neurobiological correlates. *American Journal of Psychiatry, 165*, 969–977.

Burnett, R. (2009). Mindfulness in schools: Learning lessons from the adults - secular and Buddhist. *Buddhist Studies Review, 28*(1). doi: 10.1558/bsrv.v28i1.79.

Chambers, R., Lo, B. C. Y., & Allen, N. B. (2008). The impact of intensive mindfulness training on attentional control, cognitive style, and affect. *Cognitive Therapy and Research, 32*, 303–322. Retrieved from https://ezproxy.wou.edu:4285/10.1007/s10608-007-9119-0

Chin, D. L. (2019). *Embracing vulnerability: Exploring the need for strength-based interventions to support the mental health of sign language interpreters* (master's action research project). Retrieved from https://digitalcommons.wou.edu/maisactionresearch/6

Cohen, S. (1994). Perceived Stress Scale. *Mindgarden*, 5. Retrieved from

    https://www.mindgarden.com/documents/PerceivedStressScale.pdf

Dean, R. K., & Pollard, R. Q., Jr. (2005). Consumers and service effectiveness in interpreting

    work: A practice profession perspective. In M. Marschark, R. Peterson, & E. A. Winston

    (Eds.), *Perspectives on deafness. Sign language interpreting and interpreter education:*

    Directions for research and practice (pp. 259–282). Oxford University Press.

Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J. P. (2007). Mindfulness and

    emotion regulation: The development and initial validation of the Cognitive and

    Affective Mindfulness Scale Revised (CAMS-R). *Journal of Psychopathology and*

    Behavioral Assessment, 29(3), 177-190.

Gile, D. (1997/2002). Conference interpreting as a cognitive management problem. In F.

    Pochhacker & M. Shlesinger (Eds.), *The interpreting studies reader* (pp. 162-176).

    London: Routledge.

Gile, D. (2001). The role of consecutive in interpreter training: a cognitive view. *AIIC.* Retrieved

    from https://pdfs.semanticscholar.org/8fae/d3cc164f5bf6af86f2fdb5452ac4ed80bdf1.pdf

Gile, D. (2008). Local cognitive load in simultaneous interpreting and its implications for

    empirical research. *Forum, 6*, 59–77.

Ginns, P., & Leppink, J. (2019). Special issue on cognitive load theory: Editorial. *Educational*

    Psychology Review, *31*, 255–259. Retrieved from https://doi.org/10.1007/s10648-019-

    09474-4

Grant, C. & Osanloo, A. (2015). Understanding, selecting, and integrating a theoretical

    framework in dissertation research: Creating the blueprint for your "house."

    Administrative Issues Journal, 4. DOI: 10.5929/2014.4.2.9

Gull, M. (2016). Self-efficacy and mental health among professional students: A correlational study. *International Journal of Modern Social* Sciences, 5(1), 42-51.

Harris, R. (2008). *The happiness trap: How to stop struggling and start living*. Boston, MA, US: Trumpeter Books.

Ivars, A. J., & Calatayud, D. P. (2001). "I failed because I got very nervous." Anxiety and performance in interpreter trainees: An empirical study. *The Interpreters' Newsletter, (11),* 105–118.

Ivars, A. J., & Calatayud, D. P. (2013). Mindfulness training for interpreting students. *Lebende Sprachen, 58*(2), 341–365. http://doi.org/10.1515/les-2013-0020

Jha, A. P., Stanley, E. A., Kiyonaga, A., Wong, L., & Gelfand, L. (2010). Examining the protective effects of mindfulness training on working memory capacity and affective experience. *Emotion, 10*(1), 54–64.

Johnson, L., Bolster, L., & Brown, S. (2014). States that require or accept the EIPA: Summary. Greely, CO: University of Northern Colorado. Retrieved from https://www.unco.edu/cebs/asl-interpreting/pdf/osep-project/eipa-data-summary.pdf

Johnson, J. E. (2016.) *Effect of mindfulness training on interpretation exam performance in graduate students in interpreting* (Doctoral dissertation). University of San Francisco, San Francisco, CA. Retrieved from https://repository.usfca.edu/dis/305

Kabat-Zinn, J. (1990). Full catastrophe living: Using the wisdom of your body and mind to face stress, pain and illness. *Delta*. New York, NY: Delacorte.

Klonowicz, T. (1994). Putting one's heart into simultaneous interpretation. In: S. Lambert & B. Moser-Mercer (Ed.), *Bridging the gap: Empirical research in simultaneous interpretation* (p.213-225). Amsterdam/Philadelphia: John Benjamins Publishing Co.

Retrieved from

https://books.google.com/books?id=5PYGYf6WUgcC&dq=putting+one%27s+heart+into

+simultaneous+interpretation&lr=&source=gbs_navlinks_s

Larson, M. (1984). *Translating and interpreting.* Lanham, MD, US: University Press of

America.

Mellinger, C. D., & Hanson, T. (2018). Interpreter traits and the relationship with technology and

visibility. *Translation & Interpreting Studies*: *The Journal of the American Translation &*

Interpreting Studies Association, 13(3), 366-392.

McCartney, J. (2016). Is grit the 'x-factor' for interpreters leaving the field. *Translation &*

Interpreting, *8*(1), 30-51.

Moser-Mercer, B., Kunzli, A., & Korac, M. (1998). Prolonged turns in interpreting: Effects on

quality, physiological and psychological stress (pilot study). *Interpreting, 3*(1), 47-64.

DOI: 10.1075/intp.3.1.03mos.

Mrazek, M., Franklin, M., Phillips, D. T., Baird, B., & Schooler, J. (2013). Mindfulness training

improves working memory capacity and GRE performance while reducing mind

wandering. *Psychological Science, 20*(10), 1–6.

Nadler, R., Carswell, J. J., & Minda J. P. (2020). Online mindfulness training increases well-

being, trait emotional intelligence, and workplace competency ratings: A randomized

waitlist-controlled trial. *Front Psychol, 11*(255). doi: 10.3389/fpsyg.2020.00255.

Nolen, J. L. (2018). Albert Bandura: American psychologist. *Encyclopedia Britannica.* Retrieved

from https://www.britannica.com/biography/Albert-Bandura

Pöchhacker, R. (2009). Conference interpreting: Surveying the profession. *Translation and*

Interpreting Studies, 4(2): 172–186.

Ribas, R. I., (2010, July). Gile review: Review of the book basic concepts and models for interpreter and translator training by D. Giles. *The Journal of Specialized Translation*, 263-265.

Seamster, T. L., Redding, R. E., Cannon, J. R., Ryder, J. M., & Purcell J. A. (1993). Cognitive task analysis of expertise in air traffic control. *The International Journal of Aviation Psychology*, *3*(4), 257-284.

Seeber, K. G., & Kerzel, D. (2012). Cognitive load in simultaneous interpreting: Model meets data. *International Journal of Bilingualism,16*(2), 228-242. Retrieved from https://ezproxy.wou.edu:4285/10.1177/1367006911402982

Seeber, K. G. (2011). Cognitive load in simultaneous interpreting: Existing theories – new models. *Interpreting, 13,* 176–204.

Steurer, G. (2019, March 4). Mindfulness [Audio podcast episode 33]. In *Illuminate Podcast* https://soundcloud.com/geoff-steurer/mindfulness-101-taylor-chambers-lmft-episode-33

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science, 12,* 257–285.

Vago, D. R., & Silbersweig D. A. (2012). Self-awareness, self-regulation, and self-transcendence (S-ART): A framework for understanding the neurobiological mechanisms of mindfulness. *Frontiers in Human Neuroscience,* 6, 296. Doi: 10.3389/fnhum.2012.00296.

Van Dijk, T. A., & Kintsch, W. (1983). *Strategies of discourse representation*. New York: Academic Press.

Van Dijk, S. (2013). *A step by step guide to dialectical behavior therapy.* Oakland, CA. New Harbinger Publications.

Virgili M. (2015). Mindfulness-based interventions reduce psychological distress in working

    adults: A meta-analysis of intervention studies. *Mindfulness, 6,* 326–337. Doi:

    10.1007/s12671-013-0264-0.

Vita, A. (March 25, 2014). *Gile's Effort models for interpreting.* Retrieved from

    https://www.alessandravita.com/giles-effort-model-interpreting/

Williams, M., Teasdale, J., Segal, Z., & Kabat-Zinn, J. (2007). *The mindful way through*

    depression: Freeing yourself from chronic unhappiness. New York, NY, US: Guilford

    Press.

Wilson, K. G., & DuFrene, T. (2010). *Things might go terribly, horribly wrong: A guide to life*

    liberated from anxiety. Oakland, CA: Raincoast Books.

Appendix A

Generalized Anxiety Disorder 7-item (GAD-7) scale

Over the last 2 weeks, how often have you been bothered by the following problems?	Not at all sure	Several days	Over half the days	Nearly every day
1. Feeling nervous, anxious, or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it's hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3
Add the score for each column		+	+	+
Total Score *(add your column scores)* =				

If you checked off any problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all _____
Somewhat difficult _____
Very difficult _____
Extremely difficult _____

Source: Spitzer RL, Kroenke K, Williams JBW, Lowe B. A brief measure for assessing generalized anxiety disorder. *Arch Inern Med.* 2006;166:1092-1097.

Appendix B

PERCEIVED STRESS SCALE

The questions in this scale ask you about your feelings and thoughts during the last month. **In each case, you will be asked to indicate by circling** *how often* **you felt or thought a certain way.**

Name _____ Date _____

Age _____ Gender (*Circle*): **M F** Other _____

0 = Never   1 = Almost Never   2 = Sometimes   3 = Fairly Often   4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly?	0	1	2	3	4
2. In the last month, how often have you felt that you were unable to control the important things in your life?	0	1	2	3	4
3. In the last month, how often have you felt nervous and "stressed"?	0	1	2	3	4
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	0	1	2	3	4
5. In the last month, how often have you felt that things were going your way?	0	1	2	3	4
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	0	1	2	3	4
7. In the last month, how often have you been able to control irritations in your life?	0	1	2	3	4
8. In the last month, how often have you felt that you were on top of things?	0	1	2	3	4
9. In the last month, how often have you been angered because of things that were outside of your control?	0	1	2	3	4
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

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References

The PSS Scale is reprinted with permission of the American Sociological Association, from Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24,* 386-396.

Cohen, S. and Williamson, G. Perceived Stress in a Probability Sample of the United States. Spacapan, S. and Oskamp, S. (Eds.) *The Social Psychology of Health.* Newbury Park, CA: Sage, 1988.

Appendix C

Patient Health Questionnaire (PHQ-9)

Name: _____ Date: _____

Over the last 2 weeks, how often have you been bothered by any of the following problems?	Not at all	Several Days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or over eating	0	1	2	3
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite- being so fidgety or restless that you have been moving around a lot more than usual.	0	1	2	3
9. Thoughts that you were better off dead, or of hurting yourself in some way	0	1	2	3
Add columns	+	+	+	
Total:				

10. If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?	• Not difficult at all _____ • Somewhat difficult _____ • Very difficult _____ • Extremely difficult _____

Appendix D

THE OHIO STATE UNIVERSITY

Cognitive and Affective Mindfulness Scale- Revised (CAMS-R)

Please respond to each item by marking <u>one box per row</u>	Rarely/Not at All	Sometimes	Often	Almost Always
CAMS-R1 It is easy for me to concentrate on what I am doing.	1	2	3	4
CAMS-R3 I can tolerate emotional pain.	1	2	3	4
CAMS-R4 I can accept things I cannot change.	1	2	3	4
CAMS-R5 I can usually describe how I feel at the moment in considerable detail.	1	2	3	4
CAMS-R6 I am easily distracted. (R)	4	3	2	1
CAMS-R8 It's easy for me to keep track of my thoughts and feelings.	1	2	3	4
CAMS-R9 I try to notice my thoughts without judging them.	1	2	3	4
CAMS-R10 I am able to accept the thoughts and feelings I have.	1	2	3	4
CAMS-R11 I am able to focus on the present moment.	1	2	3	4
CAMS-R12 I am able to pay close attention to one thing for a long period of time.	1	2	3	4

Scoring: Note that 6 is reversed scored. Sum of all values reflect greater mindful qualities.

Your total score: _____

Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J. P. (2007). Mindfulness and emotion regulation: The development and initial validation of the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R). *Journal of Psychopathology and Behavioral Assessment, 29*(3), 177-190. Note that original scale was 12 items, but the original items 2 and 7 were deleted as less useful than the remaining 10.