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**Evidence-Based Occupational Therapy Interventions for Children with Autism: Current
Practices and Continuing Education in Minnesota**

Bryden G. Giving

A thesis submitted in partial fulfillment of the requirements for the degree of Masters in Arts in
Occupational Therapy,
St. Catherine University, Saint Paul, Minnesota

May, 2018

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St. Catherine University
Master of Arts in Occupational Therapy
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Abstract

The purpose of this thesis was to investigate the use of non-evidence-based practices that are often used with children with autism spectrum disorder (ASD) by occupational therapy practitioners, as well as continuing education necessary to better pediatric occupational therapy practice with children with ASD in Minnesota. This mixed-methods project utilized a website content analysis, survey, and focus group data to address the research questions. The study aimed to address: (1) How do pediatric occupational therapy practitioners in Minnesota understand evidence-based practice and apply evidence-based practice principles in their work with children with ASD? (2) How are the twelve specified interventions being used currently in pediatric occupational therapy practice for children with ASD in Minnesota? and (3) What are the next steps for supporting pediatric occupational therapy practitioners in Minnesota in being evidence-based for working with children with ASD?

Findings from data analysis elucidated common themes and implications for pediatric occupational therapy practice with children with ASD in Minnesota. The first theme is occupational therapy practitioners are relying more on their clinical experience than evidence-based research when working with children with ASD. The second theme is many of these interventions are used to treat children with ASD without fidelity and by practitioners who haven't been trained in them. Lastly, practitioners reported barriers to applying evidence-based practices, including lack of time, limited resources, affordability, workplace culture, and difficulty assessing evidence-based information. The majority of occupational therapy practitioners participating were school-based practitioners. If occupational therapy wants to continue to perform a relevant service in MN, occupational therapy practitioners must reflect on the evidence base for the interventions they are selecting as well as the extent their intervention

choices address occupational participation in children with ASD. Increasing accessibility to continuing education and resources for evidence-based information is needed as well for occupational therapy practitioners working with children with ASD.

Chapter One: Introduction

Since the uncovering of autism as a human condition by Asperger and Kanner in the 1940s, practitioners responsible for education and care for children and youth with autism spectrum disorder (ASD) have sought to provide effective practices (Wong et al., 2014). Such efforts continue today; the last twenty years in the United States have seen tremendous growth in the number of children diagnosed with ASD (Ashburner et al., 2014; Center for Disease Control, 2016). The prevalence of ASD has increased in the past decade due to better recognition of the disorder, a statistical increase in incidence, and changes in reporting practices (Centers for Disease Control, 2016; Hansen, Schendel, & Parner, 2015). Accompanying the increasing number of children diagnosed with ASD, there has been a heightened rendering of research for interventions for children with ASD in the US and an increased emphasis at examining the cost of services provided (Wong et al., 2014). The total cost of medical care for children with ASD in the United States in 2011 was between \$11.5 billion and \$60.9 billion, which places financial and ethical pressure on practitioners to provide effective treatments for children with ASD (Centers for Disease Control and Prevention, 2016). Some of these pressures include delivering evidence-based practices that are cost-effective and of good value for children and families. Providing evidence-based practice implies that clinicians, including occupational therapy practitioners, have the skills to search for, analyze, and utilize research evidence to inform their clinical decisions (Baker & Tickle-Degnen, 2014; McClusky, 2003).

As occupational therapy practitioners are often involved in working with children with ASD and play a crucial role in addressing the occupational participation of children with ASD, examining current occupational therapy practice for this population is essential (Ashburner et al., 2014; Miller-Kuhaneck, 2015). In an American survey of occupational therapy practitioners

working in schools, Autism was one of the most repeatedly desired professional development (PD) topics (Spencer, Turkett, Vaughan & Koenig, 2006). Currently, sensory integration is the most sought after and favored intervention approach by occupational therapy practitioners for children with ASD (Green et al., 2006; Kadar, McDonald, & Lentin, 2012; Mandell, Novak, Zubritsky, & Levy, 2005; Watling & Hauer, 2015). The dire need for more research concerning sensory-based interventions for children with ASD has contributed to the increasing use of complementary and alternative medicine (CAM) within pediatric occupational therapy (Abbey, 2009; Ashburner et al., 2014). Comprehensive treatment models (CTMs) and focused intervention practices are two additional primary classes of interventions for treating children with ASD (Watling & Hauer, 2015; Wong et al., 2014). However, there are concerns regarding the use of CAMs for children with ASD due to their lack of evidence (Ashburner et al., 2014). There is limited research examining the effect of CAMs, focused intervention practices, and CTMs on occupational participation; thus, there is a push for more evidence-based and occupation-centered practice for children with ASD (Ashburner et al., 2014; Lamb & Meltzer, 2014; Polatajko & Cantin, 2010). Research indicates occupational therapy practitioners frequently utilize sensory-based interventions that are not evidence-based when treating a child with ASD (Thompson-Hodgetts & Magill-Evans, 2018). The limited research that does exist primarily includes nonrandomized and limited control trials along with inconsistently defined terms, which do not allow the results to be generalizable (Complementary and Alternative Medicine (CAM) Position Paper, 2005).

Expert review groups have examined many CAMs, including the twelve focused interventions of this project. The twelve CAMs focused for this thesis include (1) Auditory Integration Therapy, (2) The Listening Program, (3) Therapeutic Listening, (4) Brain Gym, (5)

Interactive Metronome, (6) Makoto Therapy, (7) Masgutova Method (MNRI), (8) Reflex Integration Training, (9) Rhythmic Movement Training, (10) Wilbarger Protocol, (11) Therasuit, and (12) Craniosacral Therapy. These twelve interventions were selected due to knowledge of them being used in pediatric occupational therapy practice in Minnesota based on student surveys from fieldwork and faculty knowledge of this area of practice (S. L. de Sam Lazaro, personal communication, September 15, 2016). Also, an extensive review analyzing and critically appraising the evidence examining these twelve interventions was completed by the St. Kate's MAOT students (Barrett et al., 2016; Garness et al., 2016; Madison et al., 2016; Thelen et al., 2016). The students found these twelve interventions lacked the evidence to support their use to address the occupations of children with ASD (Barrett et al., 2016; Garness et al., 2016; Madison et al., 2016; Thelen et al., 2016). For the purpose of the cohort's evidence-based review process, the twelve interventions were placed into four broad categories of interventions: listening therapies, reflex integration therapies, movement therapies, and sensory/manipulative therapies. Along with the St. Kate's MAOT students, expert review groups have concluded many of these interventions to be ineffective treatment methods for children with ASD due to their lack of research and not addressing the occupations of children (Myers & Johnson, 2007; Wisconsin Department of Health Services, 2016a).

In addition to the lack of evidence supporting their use, there are concerns related to billing and reimbursement of these interventions. The Early Intensive Developmental and Behavioral Intervention (EIDBI) benefit is a Minnesota health care program that serves persons under the age of twenty-one who are on Medical Assistance and have a diagnosis of ASD or a related condition and currently does not cover any of the 12 interventions listed previously (MDHS, 2017a). This can pose a significant problem for both therapists and families supporting

children with ASD since EIDBI does not cover the specified widely-used interventions, a policy insurance companies are beginning to emulate (MDHS, 2017b). As EIDBI is still a relatively new benefit, the larger impacts on occupational therapy practice in Minnesota are still unknown. For more information on EIDBI, see Appendix A.

With the prevalence of ASD on the rise and the push for evidence-based practice in occupational therapy, this thesis examined the use of twelve sensory interventions by occupational therapy practitioners in Minnesota (Ashburner et al., 2014; Lamb & Meltzer, 2014). An additional aim was to shed light on the need for professional development opportunities for evidence-based practices for children with ASD in Minnesota as the use of non-evidence-based interventions can have extensive ramifications on the lives of children and families in MN as well as impact the reputation of occupational therapy as a profession (Baker & Tickle-Degnen, 2014; Lamb & Meltzer, 2014). This study's research questions are (1) How do pediatric occupational therapy practitioners in Minnesota understand evidence-based practice and apply evidence-based practice principles in their work with children with ASD? (2) How are the twelve specified interventions being used currently in pediatric occupational therapy practice for children with ASD in Minnesota? and (3) What are the next steps for supporting pediatric occupational therapy practitioners in Minnesota in being evidence-based for working with children with ASD?

Chapter Two: Literature Review

Autism Spectrum Disorder (ASD) is characterized as a neurologic disorder with a combination of symptoms that assemble into two categories of functioning: repetitive and restrictive behaviors and social interaction (American Psychiatric Association, 2013; Lang et al., 2012; Miller-Kuhaneck, 2015). With a high variety of symptoms and levels of severity, every child has a unique combination of strengths and weaknesses that will impact their occupational participation and performance (Miller-Kuhaneck, 2015). Occupational therapy practitioners are primary providers for children with ASD (Lang et al., 2015; Miller-Kuhaneck, 2015). Some notable occupational performance issues practitioners treat for children with ASD include engagement in activities of daily living, play, education, leisure, and social activities (Ashburner et al., 2014; Miller-Kuhaneck, 2015). Sensory-based deficits experienced by children with ASD have received heightened attention in recent years (Baltazar et al., 2017; Watling & Hauer, 2015). These behaviors and symptoms (often called sensory features) experienced by children with ASD have been identified as impacting occupational participation and performance (Ben-Sasson et al., 2009; Watling & Hauer, 2015). These unusual sensory responses and behaviors that have been found within children with ASD have been noted to impact their occupations, such as social engagement (Hilton, Graver, & LaVesser, 2007; Pfeiffer, Kinnealey, Reed, & Herzberg, 2005), sensory responding and adaptive skills (Rogers, Hepburn, & Wehner, 2003), performance of daily living skills such as bathing, grooming (Hilton et al., 2007), sleep (Souders et al., 2009), and academic performance (Lane, Roley, & Champagne, 2014; Perham, 1998).

As sensory deficits are recognized as impacting occupational performance, efforts have been made to identify treatments that address these sensory difficulties to improve participation (Watling & Hauer, 2015). Within occupational therapy, practitioners have reported that sensory

integration (SI) is the most frequently used approach when providing services for children with ASD (Baltazar et al., 2017; Myers & Johnson, 2007). Ninety-nine percent of occupational therapy practitioners implement principles of sensory integration in their practice with children with ASD (Schaaf, 2011). Most health-professionals recognize that occupational therapy practitioners are the primary profession that uses SI in the United States (Reynolds, Watling, Zapletal, & May-Benson, 2012). With the increasing demand for occupational therapy services for children with ASD and concerns raised relating to the lack of evidence and effectiveness of sensory-based interventions, training in evidence-based practice using sensory processing and SI interventions is vital for occupational therapy practitioners (Baltazar et al., 2017; Section on Complementary and Integrative Medicine & Council on Children with Disabilities, 2012). The evidence-based practice process was used to examine the evidence surrounding sensory-based interventions for children with ASD.

Evidence-Based Practice Process

Fostering and implementing evidence-based practice is a precedent within occupational therapy practice (Lin, Murphy, & Robinson, 2010). Evidence-based practice is defined as the implementation of knowledge from clinical and professional expertise, patient/client unique circumstances and values, and best research evidence into current practice (Law & MacDermind, 2014; Straus, Richardson, Glasziou, & Haynes, 2005; Wong et al., 2014). Evidence-based practice is associated with better outcomes (Shin, Randolph, & Rauch, 2010; Straus et al., 2005) and is more cost-effective (Gillen, Liberman, Stutzbach, & Arbesman, 2017, Wong et al., 2014) than non-evidence-based approaches. The primary goal of evidence-based practice is to use research evidence to decrease the use of ineffective health-care practices and instead utilize effective interventions (Baker & Tickle-Degnen, 2014; Law & MacDermind, 2014; Straus et al.,

2005).

Providing evidence-based care is a highly valued ideal of the American Occupational Therapy Association (AOTA) (American Occupational Therapy Association, 2017; Gillen et al., 2017). Not only is it valued, but it is a responsibility of practitioners to be evidence-based in their practice and demonstrate the knowledge and skills to apply research when making their clinical decisions (Baker & Tickle-Degnen, 2014; McClusky, 2003). Though providing evidence-based practice is an essential part of the occupational therapy profession, the profession needs improvement regarding the implementation of evidence-based research into practice.

Occupational therapy practitioners have reported a low level of knowledge, involvement, and skill in evidence-based practice (McClusky, 2003) and research has indicated that practitioners do not always have the support and information needed to implement evidence-based practice (Upton, Stephens, Williams, & Scurlock-Evans, 2014). Research has shown that consumers know more about the evidence concerning their condition than their training occupational therapist (Miller & Willis, 2000). Also, occupational therapy practitioners working with children with ASD have historically relied more on clinical experience and colleagues rather than research evidence (Ashburner et al., 2014).

The process below outlines the steps for integrating research evidence into practice (Lin, Murphy, & Robinson, 2010; Mayer, 2010; Straus et al., 2005):

1. Pose an answerable research question
2. Search and collect current published evidence that addresses your research question
3. Appraise the gathered evidence to determine which evidence is “the best” to answer your question (evaluating the type of evidence, research design,

investigator qualifications, where is it published, etc.)

4. Critically review the best evidence (such as systematic reviews, examining for consistent/inconsistent findings, etc.)
5. Apply the best evidence to guide practice for clients while also communicating the evidence results to patients.

One of the best forms of available research evidence are systematic reviews (Ottenbacher, Heyn, & Abreu, 2017). Systematic reviews are created by a group of researchers collaborating on searching, examining, and synthesizing all the available evidence on a specific topic (Ottenbacher et al., 2017). In addition to systematic reviews, expert review groups are another avenue for practitioners to obtain knowledge related to evidence-based practice as they help to ensure quality services are provided to the public (Myers & Johnson, 2007; Wisconsin Department of Health Services, 2016a; Wong et al., 2013). The Wisconsin Treatment Intervention Advisory Committee (TIAC) is an expert review group, which supports the Department of Health Services in ensuring quality services are being promoted for the citizens of Wisconsin (Wisconsin Department of Health Services, 2016a, 2016b). Specifically, they analyze the quality of the evidence examining the effectiveness of non-medical interventions for children with ASD and other developmental disabilities (Wisconsin Department of Health Services, 2016b). TIAC members review and assess research to document determination levels of interventions reviewed; these levels range from Level 1 (well established or strong evidence) to Level 5 (untested/experimental treatment and/or potentially harmful) (Wisconsin Department of Health Services, 2016a, 2016b). The reviews of the treatment interventions and their findings are discussed in meetings open to the public (Wisconsin Department of Health Services, 2016b). All twelve interventions that are the focus of this thesis went through the evidence-based review

process by a cohort of Master of Arts in Occupational Therapy students at St. Catherine University in 2016 (Barrett et al., 2016; Garness et al., 2016; Madison et al., 2016; Thelen et al., 2016). Due to their established processes and norms, TIAC levels were considered a critical piece to the evidence review conducted by the cohort of students.

The twelve interventions focused on this thesis constitute four categories: (1) listening, (2) movement, (3) reflex integration, and (4) sensory/manipulative therapies. Auditory integration training (AIT), the Listening Program (TLP), and Therapeutic Listening are three listening interventions included in this thesis. These three listening interventions focus on how auditory hypersensitivities and abnormalities affect a child's development (Bazyk., Cimino, Hayes, Goodman, & Farrell, 2010; Sinha, Silove., Wheeler, & Williams, 2006; Vargas & Lucker, 2016). The movement category consists of Brain Gym, Interactive Metronome, and Makoto Therapy. These three interventions that target coordination, physical stimulation, and motor responses through the method of movement (Hilton et al., 2014; Hyatt, 2007; Kim, Bo, & Yoo, 2012). For the reflex integration category, Masgutova Method (MNRI), Reflex Integration, and Rhythmic Movement Training (RMT) all aim to reinforce and integrate primary motor reflex patterns within their participants (Chinello, Gangli, & Valenza, 2016; Masgutova, Akhmatova, Sadowska, Shackleford, and Akhmatov, 2016; Wisconsin Department of Health Services, 2015). And for the final category concerning the sensory/manipulative therapies, the Wilbarger Protocol, Therasuit, and Craniosacral Therapy (CST) were selected. These three therapeutic interventions that focus on improving sensory defensiveness using touch (Bailes et al., 2011; Jakel & von Hauenschild, 2012; Lancaster et al., 2016). In summary, all twelve interventions focused within this thesis were found to be non-evidence-based and experimental or experimental and/or potentially harmful (Barrett et al., 2016; Garness et al., 2016; Madison et al.,

2016; Thelen et al., 2016).

The information that the twelve interventions are not evidence-based, but are regularly used in some practice areas was of concern. In addition, the underutilization of evidence-based practice by occupational therapy practitioners is especially precarious concerning treatments for children with ASD as many new intervention practices which are prevalent in these populations are not occupation centered in nature (Upton, Stephens, Williams, & Scurlock-Evans, 2014).

Occupational Therapy Theoretical Model Informing Project

As stated by Law (2002), “Occupational therapy focuses on enabling individuals and groups to participate in everyday occupations that are meaningful to them, provide fulfillment, and engage them in everyday life with others” (p. 640). This definition includes children, whose occupations include participation in self-care, play, leisure, education, social participation, and more (Case-Smith, 2015; Rodger, Ziviani, & Lim, 2015). While children are developing, they may undergo health conditions or environmental and personal factors that can impact their occupational performance (Case-Smith, 2015; Rodger et al., 2015). Occupational therapy practitioners’ work by focuses on helping children overcome these occupational barriers (Case-Smith, 2015; Rodger et al., 2015). Though occupational therapy practitioners understand children on a body structure and functional level, occupational therapy is not pathogenic or diagnostic-based. Instead, occupational therapy, focuses on the occupational performance strengths and challenges presented by the child (Rodger, Ashburner, Cartmill, & Bourke-Taylor, 2010; Rodger et al., 2015).

The Person-Environment-Occupation-Performance Model. Occupation-based approaches have been well-researched, and evidence frequently supports their positive effects on occupational performance (Case-Smith, 2015). One occupation-based model with consistent

evidence of effectiveness is the PEOP model (Baum, Christiansen, & Bass, 2015). The PEOP model is an ecological-transactional systems model, which means this model focuses on the characteristics of the individual within his or her environment (Baum et al., 2015).

Understanding how the characteristics of the individual interact with their environmental factors is essential for occupational therapy practitioners to help support that individual's occupational performance (Baum et al., 2015). Naturally, occupational therapy practitioners implement this model when working with children with ASD by focusing on the needs of the family as well as the child and examining what aspects of the child, family, and environment provide occupational challenges (Baum et al., 2015).

The concept of occupational performance has become an integral part of most models of occupational therapy (Baum et al., 2015; Case-Smith, 2015). The PEOP model is no different as it was created to help practitioners organize evidence-based knowledge and their clinical reasoning to address a person's occupational performance needs and support participation (Baum et al., 2015). According to Law, Baum, & Dunn (2005), an essential use of the PEOP model for therapeutic services for children with ASD includes identifying occupational performance issues. With identifying the occupational performance deficits, interventions are created to target adaptations that can be made for the child, the occupation, and/or the environment to enhance the child's occupational performance (Law et al., 2005). In practice, occupational therapy practitioners' interventions may use (1) occupations and activities, (2) preparatory methods and tasks, (3) education and training, (4) advocacy, and/or (5) group interventions to target changes to the child/family, occupations, and/or environment (American Occupational Therapy Association (AOTA), 2014, p. S29-S31). While all five of the intervention categories are part of occupational therapy practice, occupations and activities are a foundation of the profession not

only as the outcome of therapy but also as a means to achieving the outcome (AOTA, 2014).

While occupations and activities are a highlight of the profession as a whole, one type of intervention that is a cornerstone for treating children with ASD by pediatric occupational therapy practitioners is sensory integration interventions (Rodger, Brown, & Brown, 2005; Lang et al., 2015; Miller-Kuhaneck, 2015). This is partially due to research creating increased awareness and attention to the sensory features of the disorder to help understand their impact on occupational performance for children with ASD (Ben-Sasson, 2009; Watling & Hauer, 2015). Within occupational therapy, interventions to address sensory processing issues are generally grouped into two categories: Ayers Sensory Integration® (ASI) and sensory-based interventions (SBIs) (Watling & Hauer, 2015). ASIs are occupation and activity based and based on the principles of play and following the child's lead to support sensory processing and occupational participation (Ayers, 2005; Watling & Hauer, 2015). SBIs on the other hand sometimes involve occupations and activities while utilizing the intervention, but are not inherently occupation or activity based (Parham & Mailloux, 2015). SBIs may include sensory stimulation protocols, sensory-based strategies, individual training in specific skills, and group interventions (Parham & Mailloux, 2015). Sensory stimulation protocols involve the application of a sensory stimuli in a regimented way under the supervision of a practitioner, such as the Wilbarger Protocol, Craniosacral Therapy, Therasuit, The Listening Program, Therapeutic Listening, and AIT (Parham & Mailloux, 2015). Sensory-based strategies are not as regimented as sensory stimulation protocols and are administered by parents, teachers, or other caregivers after training from the therapist and may include things such as Brain Gym (Parham & Mailloux, 2015). Finally, individual training in specific skills are interventions that are specifically focused on improving neurological function that could later impact functional skills including

interventions such as Interactive Metronome, Rhythmic Movement Training, Reflex Integration, and MNRI (Parham & Mailloux, 2015). For all types of SBIs (sensory stimulation protocols, sensory-based strategies, and individual training in specific skills) there is very limited evidence to support these interventions in practice (Parham & Mailloux, 2015). See Appendix B for the examination of evidence evaluating the twelve specified interventions and Appendix C for examination of the hallmarks of the theoretical background of sensory integration practice.

Both ASI and SBIs are founded in the premise that interventions must be individualized due to the unique needs of children with ASD. Individualization of services is a unique component of occupational therapy practice. To address the unique needs of children with ASD, two types of intervention delivery models are used to treat children with ASD across various disciplines of practice: comprehensive treatment models and focused intervention practices.

Intervention Delivery Model Informing Project

There are two classes of interventions that are utilized when treating a child with ASD appearing in the literature (Smith, 2013), and they are identified as comprehensive treatment models (CTMs) and focused intervention practices (Wong et al., 2014). Within both CTMs and focused intervention practices, there are more traditional interventions used as well as complementary and alternative medicine used.

Comprehensive Treatment Models (CTMs). A CTM is an intervention approach that contains a set of practices created to achieve a broad learning or developmental effect on the core deficits of ASD (Odom, Boyd, Hall, & Hume, 2010; Wong et al., 2014). CTMs “are characterized by:

- organization (i.e., around a conceptual framework);
- operationalization (i.e., procedures manualized);

- intensity (i.e., substantial number of hours per week, such as 25 hours);
- longevity (i.e., occur across one or more years); and
- breadth of outcome focus (i.e., multiple outcomes such as communication, behavior, social competence targeted)” (Wong et al., 2014, p. 3).

Some examples of identified CTMs include Applied Behavioral Analysis (ABA), the Denver Model, and the TEACCH program (Wong et al., 2014), with all five being designated as a traditional form of a CTM. Odom et al. (2010) identified 30 CTM programs functioning within the United States, with some showing higher levels of efficacy than others.

Focused Intervention Practices. In contrast, focused intervention practices are created to produce a specific developmental outcome focus on a single goal or skill of a student with ASD (Odom et al., 2010; Wong et al., 2014). These intervention practices address a specific outcome and generally occur over a shorter period of time (e.g., three months) than CTMs with the intent of showing change in a targeted behavior (Wong et al., 2014). Examples of traditional focused intervention practices include pivotal response training, video modeling, and prompting. Focused intervention practices have evidence of efficacy and effectiveness concerning children with ASD (Odom et al., 2003).

As comprehensive treatment models and focused based interventions become more commonly used in pediatric practice, though evidence is not keeping up with their use, clinicians are broached with ethical and practical dilemmas regarding interventions used within pediatric practice. The twelve interventions focused on for this thesis can be considered CTMs and focused intervention practices, depending on how they are utilized by therapists (e.g., how long they are used as an intervention for treatment and in what format they are used). As mentioned earlier, research examining SBIs found little to no effect on improving the sensory processing

issues, behavioral challenges, and symptoms experienced by children with ASD (Watling & Hauer, 2015).

Complementary and Alternative Medicine (CAM). Within the categories of CTMs and focused based interventions, some interventions are considered CAMs. CAM refers to the group of health care systems and interventions that are not considered to be integrated within conventional medicine (Hofer, Hoffman, & Bachman, 2017; Kurtz, 2008). The American Occupational Therapy Association (AOTA) included a position paper that asserts that CAMs may be used by occupational therapy practitioners if caution is considered when applying the CAM therapy (AOTA, 2005). For example, AOTA stated that many CAM techniques used within occupational therapy practice often require additional training and certification to make sure practitioners are using the interventions with fidelity (AOTA, 2005). Like in any group of interventions, there are some treatments categorized as CAMs that have higher levels of evidence than others (AOTA, 2005). For the purposes of this thesis, all twelve of the specified interventions are designated as being a form of complementary and alternative medicine, and these twelve CAMs do not have substantial evidence to support them.

According to the National Health Interview Survey (NHIS), 12% of children in the United States used a form of CAM in 2012 with up to 50% of children with ASD using a CAM therapy (Black, Clarke, Barnes, Stussman, & Nahin, 2015; Clarke, Black, Stussman, Barnes, & Nahin, 2015; Nickel, 1996). A systematic review analyzing 15 studies completed by Hansen et al. (2015) reported the overall use of CAMs among children with ASD ranged from 28% to 95%, with the lifetime use of CAMs for children with ASD ranging from 39% to 92%. In 2007, the National Center for Complementary and Integrative Health (NCCIH) stated 83 million consumers spent \$33.9 billion in out-of-pocket expenses on CAM therapies, which constitute

11.2% of all out-of-pocket expenditures on health-care (Nahin, Barnes, Stussman, & Bloom, 2017). The popularity of CAMs and the cost of CAMs along with the lack of evidence for their use with the ASD population pose significant concerns related to client beneficence, non-maleficence, and fidelity (AOTA, 2015).

Practice Dilemma Conclusion

Services for children with ASD are a critical need area in MN (The Department of Human Services, personal communication, 2018). However, there are significant concerns related to the evidence and safety of the interventions identified as a focus of this project (Barrett et al., 2016; Garness et al., 2016; Madison et al., 2016; Thelen et al., 2016) (see Appendix B). The limited and conflicting evidence examining the effectiveness of these twelve interventions on the occupations and participation of children with ASD pose compelling ethical and practical implications (Barrett et al., 2016; Garness et al., 2016; Madison et al., 2016; Thelen et al., 2016) (see Appendix B). First, any interventions that are being provided by occupational therapy practitioners for children with ASD should be addressing a child's occupations and be supported by a high caliber of evidence. Secondly, coverage of occupational therapy services by EIDBI or other payer sources may be limited due to lack of evidence supporting their use, placing the financial burden on the caregiver for non-evidence-based interventions. Lastly, the Wisconsin Treatment Intervention Advisory Committee, as well as other expert review groups, have made determinations on several these twelve forms of CAMs, and have cited them as unsupported by evidence and/or not effectively addressing the occupations of children with ASD and in some cases potentially harmful (Myers & Johnson, 2007; Wisconsin Department of Health Services, 2016a) (See Appendix B).

Although there has been work consolidating the use of evidence-based interventions

within occupational therapy for children with ASD, to date there has been no extensive review regarding the use of non-evidence-based interventions (including the twelve specified interventions) within occupational therapy practice in Minnesota (Case-Smith & Arbesman, 2008; Myers & Johnson, 2007; Odom et al., 2010; Wisconsin Department of Health Services, 2016a; Wong et al., 2014). There is also no known research examining how these twelve interventions are used in practice. Are these twelve interventions being used as CAMs, CTMs, or focused intervention practices? As many of these twelve interventions have sensory components, do they align with the occupation centered approach of ASI or are they utilized as short-term SBIs? Are they used as occupations and activities, preparatory methods, education and training, advocacy, group intervention or a combination of these methods? As some of the 12 interventions are 30-60 minutes in length per session, if they are used as a preparatory method, is this an ethical use of a treatment session time? These questions raise concerns about the profession of occupational therapy's use of non-evidence-based interventions for children with ASD and many ethical implications such as beneficence, non-maleficence, and fidelity. A clearer understanding of how these interventions are being used in pediatric practice in Minnesota for children with ASD will allow recommendations to be made for changes in practice and professional development needs for pediatric occupational therapy practitioners across the state.

Chapter Three: Methods

Evidence-Based Review

In 2016, a cohort of students examined Population-Intervention-Comparison-Outcome (PICO) questions using the evidence-based process (EBP) process to determine recommendations on the twelve specified pediatric interventions. The twelve interventions investigated were (1) Auditory Integration Therapy, (2) The Listening Program, (3) Therapeutic Listening, (4) Brain Gym, (5) Interactive Metronome, (6) Makoto Therapy, (7) Masgutova Method (MNRI), (8) Reflex Integration, (9) Rhythmic Movement Training, (10) Wilbarger Protocol, (11) Therasuit, and (12) Craniosacral Therapy (Barrett et al., 2016; Garness et al., 2016; Madison et al., 2016; Thelen et al., 2016). The findings of the cohort's EBP reviews and findings concerning supporting research for the twelve interventions were used to develop categories for the web content analysis (Barrett et al., 2016; Garness et al., 2016; Madison et al., 2016; Thelen et al., 2016).

Website Content Analysis

A content analysis of websites was completed to examine how many sites in Minnesota providing pediatric occupational therapy services endorsed the use of the twelve specified interventions. Content analysis is a widely used qualitative research method tool for examining any piece of text and making inferences to their context (Kim & Juljis, 2010; McNiff, 2017). Content analysis is interpretive in nature and allows the researcher to access public data generated by users while avoiding lengthy ethics approval procedures (Kim & Juljis, 2010). An initial template was created and tested on two sites. After testing an initial template, insight was gained from two professors and used to construct the final website template, which can be found in Appendix D.

Method. Any setting (private practice, clinic, hospital, etc.) that could be found through an internet search and provided pediatric occupational therapy services in Minnesota was included within the analysis. The target population consisted of sites practicing pediatric occupational therapy in Minnesota. The primary method of searching included Google™ along with sites recommended by professors, as well as utilizing a list of fieldwork sites in Minnesota provided to the cohort of students. Consistent google search terms, such as *occupational therapy*, *pediatric*, and *Minnesota* were used for all the searches. Sites that did not provide any occupational therapy based services to children or were not present in Minnesota were excluded from this study, as well as school-based settings. Because all data collected was taken from webpages and other documents available to the general public, no issues of anonymity applied.

Two well-known sites in the Twin Cities area were selected to pilot the data collection. Categories of data collection included: (1) location, (2) reference to any of the 12 interventions on their website and where it was referenced, (3) information on clinicians certified in providing any of the 12 interventions, and (4) information related to cost and insurance coverage of services. Based on this pilot, all categories were used for the full content analysis and a second row of information was added for each site to add additional information in any of the specified category columns. After the full content analysis, sites with three or more locations were designated “systems” whereas locations with only one or two sites were coined “sites.”

Data analysis. Once data collection was complete, descriptive statistics were used to examine how many sites promoted each of the 12 interventions and the four categories of interventions (listening, movement, reflex, and sensory/manipulative) on their websites. These descriptive statistics were used to configure themes found throughout the analysis. In addition to looking at the data as a whole, descriptive statistics were used to examine any trends based on

geographic region (inside or outside the Twin Cities) and the type of setting (site versus system).

A site consisted of one or two settings whereas a system was a setting with three or more settings. Settings designated as within the Twin Cities are settings located within the following counties: Anoka, Hennepin, Carver, Scott, Dakota, Ramsey, and Washington. A total of 49 settings were collected and analyzed.

Survey Development and Distribution

Based on the review of the website content analysis data, a survey consisting of 100 close-ended items was developed to examine how pediatric occupational therapy practitioners view and utilize the twelve specified interventions. The survey consisted of demographic questions, questions about knowledge of the interventions as a whole, and then skip pattern questions to obtain more specific information about each of the twelve interventions. For example, if a respondent did not select “Auditory Integration Training” for Question #10 (Which of these interventions have you heard of/used before), all follow-up questions concerning Auditory Integration Training were not visible for the participant since this intervention would be not be considered applicable to them. The follow-up questions consisted of the following for each intervention: (1) are you trained in Auditory Integration Training (only for those who answered “yes” to item 1), (2) what led you to pursue training Auditory Integration Training, (3) to your knowledge, are you using Auditory Integration Training as a Comprehensive Treatment Model, (4) have you used Auditory Integration Training while working with a child with ASD, (5) what percentage of your intervention time spent with clients with an ASD diagnosis is spent using Auditory Integration Training, and (6) have you seen other occupational therapists use this intervention while working with a child with ASD. This skip pattern feature was added to the

survey to increase the speed and efficiency of survey completion for participants. See Appendix E for the complete survey.

Method and Data Analysis. The survey procedures were approved by the Institutional Review Board (IRB) of St. Catherine University (IRB #922) and participants demonstrated consent by advancing past the consent information of the survey and responding to items within the survey. The survey design applied was selected due to its ability to allow for effective data collection from a large sample (Fowler, 2009). The survey was created using Qualtrics, a web-based software that can be used to conduct survey research and analyze survey data (California State University - Long Beach, 2015). An electronic web-based survey was administered due to the following advantages: they can be completed at the respondent's convenience, administration of the survey can incorporate features paper questionnaires cannot (checkboxes, skip patterns), and data can be directly imported for analysis (Dillman, Smyth, & Christian, 2014; Forsyth, & Kvis, 2017). Best practice regarding the format of the questionnaire was incorporated to allow for the reading of the questions, recording answers, and instructions in a manner that was as easy as possible (Dillman et al., 2014; Forsyth, & Kvis, 2017). The consent form and IRB approval for the survey can be found in Appendix F and Appendix G, respectively.

The survey was emailed to a pool of practitioners known to practice pediatric occupational therapy within Minnesota as well as emails collected via the website content analysis search to a total of 197 practitioners. The survey was then distributed via the snowball method: those who received the survey via email also had the opportunity to forward it to other occupational therapy practitioners they knew who work in pediatric settings in Minnesota. Potential participants received an email describing the purpose of the study. Respondents were included in the study if they completed the survey and indicated they worked in pediatrics. One

month after the survey had been distributed a follow-up reminder was sent for survey completion. The survey remained open and active for a total of six weeks in the months of October 2017 and November 2017. The last section of the survey pertained to asking respondents if they would be interested in participating in future research and if so, they provided their email which was not linked to any of the previous responses in the survey to maintain anonymity. The survey results were analyzed using descriptive statistics and Chi-Square Analyses within Qualtrics to answer the research questions.

Focus Group Development

To further explore themes found from the survey data results and additional details on evidence-based practices in Minnesota, focus groups consisting of occupational therapy practitioners were conducted. Focus groups were chosen due to their capabilities of gathering detailed data from multiple persons at once to gather information efficiently (Lysack, Luborsky, & Dillaway, 2017). Another reason for selecting the methodology of focus groups is they provide the opportunity for information to emerge resulting from the dynamic interactions between participating group members (Lysack et al., 2017). The participating occupational therapy practitioners were selected based on a question within the survey (Question #98) indicating if they would be interested in participating in focus groups.

Method. A Doodle poll was created and sent to the 51 practicing occupational therapy practitioners who indicated interest in participating in the focus groups to determine what days and times would be utilized for the highest attendance. After two different days and times were selected, another email was sent out to the 51 practitioners. For best practice (Lysack et al., 2017), the same number of participants were in each focus group ($n = 5$). Both focus group meetings occurred in the same conference room on the Saint Catherine University campus. Each

meeting lasted approximately two hours. Participants read and signed the consent form before the start of the focus group, indicating their consent to participate and to be audio recorded. Participants were given one week after the focus group to let a researcher know if they no longer wanted their data to be included within the research. Each focus group was conducted utilizing the script and questions found in Appendix H. A list of the twelve interventions was provided on sheets of paper for the participants to reference. Information for focus group question #2a was provided on the whiteboard in the conference room. Audio of the focus groups was recorded utilizing the media platform, Panopto.

Data Analysis. The focus group discussions were transcribed verbatim within Panopto and exported to a Microsoft word file. The scissor-and-sort technique was the method used to analyze the focus group transcription (Stewart, Shamdasni, & Rook, 2007). This method was selected due to its emphasis on analyzing the transcription for themes and categories of topics (Stewart et al., 2007). The researcher determines which segments of the transcription are important, creates a categorization system for the themes discussed by the focus groups, creates representative statements regarding the themes from the transcript, and develops an interpretation of what all of the text means (Stewart et al., 2007). Three research questions guided coding to analyze for themes: (1) How do pediatric occupational therapy practitioners in Minnesota understand evidence-based practice and apply evidence-based practice principles in their work? (2) How are the twelve specified interventions being used currently in pediatric occupational therapy practice for children with ASD in Minnesota? and (3) What are the next steps for supporting pediatric occupational therapy practitioners in Minnesota in being evidence-based, particularly for working with children with ASD? The use of research questions to guide qualitative analysis for themes is supported by the qualitative template analysis technique (King,

2004). As this thesis used multiple steps in data collection (web content analysis, survey, and focus group) with specific research questions for all three phases, using the qualitative template analysis technique allowed the researcher to keep the research questions and current codes/themes from the previous steps of data collection in mind while also allowing the opportunity for other codes and themes to emerge in order to maintain an unbiased process (King, 2004). Line by line coding for analysis of themes and subthemes were used to identify the final themes addressing the three identified research questions for the results. Color-coded highlights linked to these three questions were used to mark for themes, which are designated as Level II codes. Level I codes were created to differentiate subsections within the Level II code. See Appendix I for the Level I and Level II codes.

Once the coding process was finished, the new coded copy of the focus group interview was cut apart (the scissors section of the technique) (Stewart et al., 2007). Each part of the coded material was cut out and sorted, so all material relevant to a particular theme or topic is placed together (Stewart et al., 2007). Once the pieces were spliced together, the researcher interpreted what the different themes mean concerning the research questions (Stewart et al., 2007).

To maximize reliability, the transcription was read, and the coding was created by both the principal student investigator and the investigator's advisor. Common patterns were conceptualized using the coding created by both analysts. See Appendix J and Appendix K for the focus group consent form and IRB approval for the focus groups, respectively.

Chapter Four: Results

Website Content Analysis

A total of 49 settings were identified as meeting the criteria for inclusion in the web content analysis. Of the 49 settings, 12 were considered as “systems” whereas 37 were considered as “sites,” 40 were in the Twin Cities, and nine were outside the Twin Cities. The content analysis revealed 57% of all settings ($n = 28$) promoted at least one of the twelve specified interventions on their website. Twenty-five percent of systems ($n = 3$) promoted at least one of the twelve specified interventions and one system named three of the twelve specified interventions on their website. Regarding sites (one or two locations), 67% ($n = 25$) promoted the use of at least one of the twelve interventions on their websites. Forty percent of Minnesota sites ($n = 15$) listed three or more of the twelve interventions, with 14% ($n = 5$) of sites advertising five or more of the twelve interventions on their website. One site promoted the use of eight of the twelve specified interventions on their website.

Concerning the interventions themselves, the most endorsed intervention out of the twelve specified interventions was Therapeutic Listening, and the most used intervention group was the listening therapies ($n = 35$, 38.9%) (Auditory Integration Training, the Listening Program, and Therapeutic Listening). The least used intervention group was the sensory/manipulative therapies ($n = 13$, 14.4%) (Wilbarger, Craniosacral Therapy, and Therasuit). The only intervention not found amongst the web content search was Therasuit. The most used movement, reflex integration therapy, and sensory/manipulative interventions were Interactive Metronome, Masgutova Method (MNRI), and Craniosacral Therapy, respectively. For a breakdown of the number of interventions in each of the four categories by site, system, inside the Twin Cities, and outside the Twin Cities, see Figure 1. Research and data, including

the website content analysis, were included for poster presentations at the 2017 Minnesota School-Based PT / OT Institute as well as 2017 MOTA Conference. The poster can be viewed in Appendix L.

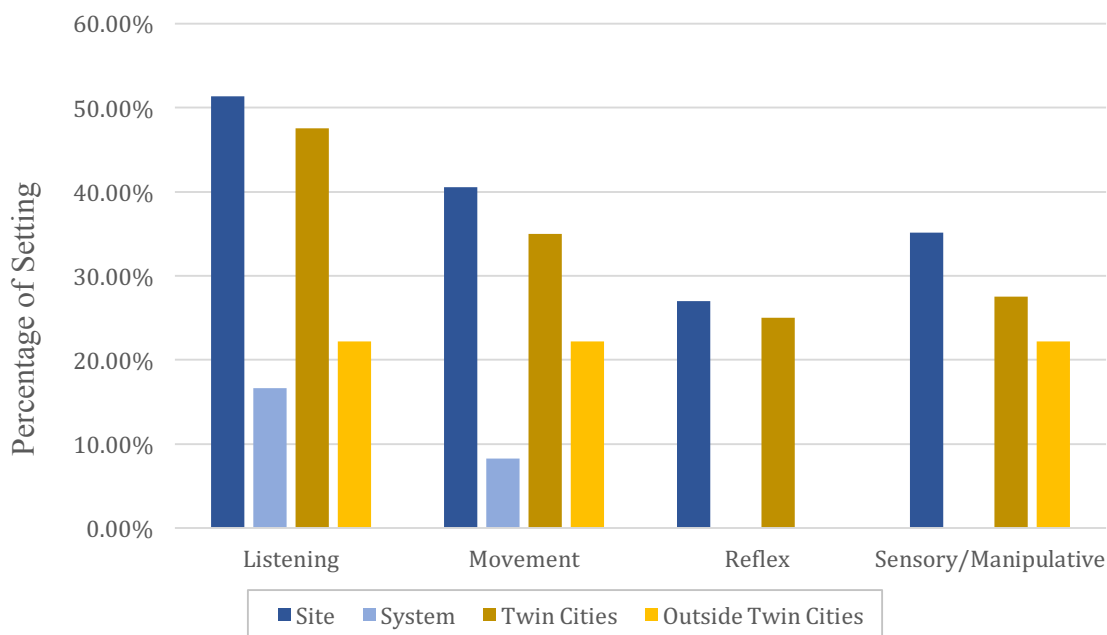


Figure 1. Percentage of Settings Endorsing At least One Intervention – This figure shows the percentage of sites, systems, inside the Twin Cities settings, and outside the Twin Cities settings that advertise utilization of at least 1 of the specified interventions on their website. The figure is split up by intervention category.

Survey Data Analysis

Email for recruitment for survey participation was sent to 197 practitioners known to practice occupational therapy in pediatric settings in Minnesota. Some of these individuals may have forwarded the email to other colleagues, thus a total recruitment number is uncertain. At the beginning of survey deployment, Question #8 (“What is your primary place of practice when working with children with ASD out of the five settings?”) was modified from its original embodiment asking for a secondary setting of practice. Respondents stated the rank-ordering

required of the question did not work for their electronic device or they were unable to select a second option. The rank-order question then became a multiple-choice question only asking for the primary placement. Data from this question was still used for analysis since respondents could select a primary setting of practice.

Participants. This section analyzes the frequencies obtained for the demographic questions of the survey examining the type of practitioner, clinical experience in practice, place of practice, and more (Question #2 through Question #9 of the survey). Based on the 197 invitations initially sent, 105 participants answered at least one item on the survey for an estimated response rate of 53%. All data collected were included for analysis, including surveys that were not fully completed ($n = 36$, 34.00%). All respondents but two were occupational therapists; two were certified occupational therapy assistants. The majority of respondents fell into the book-end categories for years of experience, with nearly one-third of the respondents ($n = 25$, 29.07%) practicing for <5 years and over one-third of respondents ($n = 27$, 31.40%) with 25+ years of general clinical experience. More than half of the respondents had obtained a master's degree in occupational therapy ($n = 54$, 62.79%). Most respondents work within the Twin Cities ($n = 72$, 83.72%), with the remaining majority of respondents working in central Minnesota ($n = 6$, 6.98%). See Table 1.

Approximately one-third of respondents ($n = 28$, 32.56%) reported having less than five years of pediatric experience whereas less than one-third of respondents ($n = 18$, 20.93%) reported having 25+ years of pediatric experience. Out of 85 responses, one-fourth of respondents ($n = 23$, 27.06%) indicated spending 15% - 30% of their time working with children with ASD. Over one-half of respondents ($n = 46$, 51.69%) reported working in schools. Other frequent responses included inpatient ($n = 16$, 17.98%) and outpatient care ($n = 20$, 22.47%).

One respondent stated that none of the settings provided were their primary place of practice for working with children with ASD. Additional information on experience related to pediatrics and children with ASD can be found in Table 1.

Table 1.

Professional Characteristics of Respondents

Characteristic	Number of responses (<i>n</i> = 86)	%
Type of practitioner		
Occupational therapist	84	97.67
Occupational therapy assistant	2	2.33
Clinical experience, yrs		
0-10	35	40.7
10-20	19	22.1
20+	32	37.2
Clinical experience in pediatrics, yrs		
0-10	38	44.2
10-20	20	23.3
20+	28	32.5
Highest degree obtained		
Associate's	2	2.33
Bachelor's	25	29.07
Master's	54	62.79

Doctoral (e.g., = OTD or Ph.D.)	5	5.81
Current location of practice		
Southern MN	3	3.49
Southwest MN	1	1.16
Twin Cities	72	83.72
Central MN	6	6.98
West Central MN	4	4.65
Northland MN	0	0.00
Northwest MN	0	0.00
Percentage of time working with children with ASD		
<i>(n = 85)</i>		
0%-30%	28	32.94
30%-60%	42	49.41
60%+	15	17.65
Primary setting when work with children with ASD (<i>n =</i>		
89)		
Inpatient	16	17.98
Outpatient	20	22.47
School-Based	46	51.69
Home-care	1	1.12
Private Practice	5	5.62
Other	1	1.12

Note. % = percentage of respondents

Analysis of percentage of time spent treating a child with ASD. In addition to the time clinicians spent working with children with ASD, clinicians were asked to provide information on the percentage of time they use each of these twelve interventions with children with ASD. The specific survey question was “_____ of my intervention time with clients with an ASD diagnosis is spent using this intervention” from the survey for each intervention. The response options for this survey question were: (a) less than 25%, (b) 25% - 50%, (c) 50% - 75%, and (d) more than 75%. For all interventions, “less than 25% of the time” was the most frequent response for the amount of time an intervention is utilized during a session treating a child with ASD. In general, as the percentage of time of an intervention session went up, the percentage of respondents in that category went down. For example, the highest percentage of clinicians responding to the question indicated they used the intervention less than 25% of the time, with a smaller percentage indicating 25-50%, and an even smaller percentage indicating 50-75%. This trend was true for all but two interventions, MNRI and Reflex Integration Training. For Masgutova Method ($n = 4$) and Reflex Integration Training ($n = 3$), more therapists reported using the intervention for 50-75% of the session than those using the intervention for 25-50% of the session. Masgutova Method and Reflex Integration Training were also the highest percentages (30.80% and 14.30%, respectively) in the 50-75% column than in comparison to the other percentage columns. In addition, all three of the reflex therapies had the highest number of therapists indicating 50-75% as the percentage of time they use these interventions during a session. Two of the reflex therapies, Reflex Integration ($n = 17$, 80.90%) and Rhythmic Movement Training ($n = 5$, 50.00%) also had the highest frequencies of the 25-50% range. See

Table 2 for a comparison of how much of an intervention session clinicians utilize an intervention when treating a child with ASD.

Table 2.

Intervention	Less than 25%	25-50%	50-75%	More than 75%
Auditory Integration Therapy	5 (100.00%)	0	0	0
Therapeutic Listening	23 (76.67%)	5 (16.70%)	1 (3.30%)	1 (3.30%)
The Listening Program	6 (100.00%)	0	0	0
Brain Gym	32 (94.41%)	2 (5.90%)	0	0
Interactive Metronome	11 (91.67%)	1 (8.30%)	0	0
Makoto	2 (100.00%)	0	0	0
MNRI	6 (46.10%)	3 (23.10%)	4 (30.80%)	0
Reflex Integration	17 (80.90%)	1 (4.80%)	3 (14.30%)	0
Rhythmic Movement Training	5 (50.00%)	4 (40.00%)	1 (10.00%)	0
Wilbarger	41 (83.67%)	5 (10.20%)	3 (6.10%)	0
Therasuit	2 (100.00%)	0	0	0
Craniosacral	6 (100.00%)	0	0	0
Total	156 (82.10%)	21 (11.10%)	12 (6.30%)	1 (0.50%)

Note. *N* is different for each intervention due to skip patterning

Influences for clinicians' pursuing training in the specified interventions. This data analyzes the frequencies of "what led you to pursue training in this intervention method?" from the survey for each intervention. The options to this survey question include: (a) a caregiver of a client mention it, (b) a colleague was trained in it, (c) my site requires/endorse training in this intervention method, (d) I read about it in a journal or other scholarly work, (e) I heard about it through mailing to my home or workplace, (f) I saw it on the AOTA approved provider list, (g) social media groups, and (h) other. The most frequent method of pursuing training in one of the interventions was due to a colleague being trained in it ($n = 58$). For Therapeutic Listening, Masgutova Method, Reflex Integration Training, Rhythmic Movement Training, and Wilbarger Protocol, knowing a colleague was trained in this intervention was the most frequent reason for pursuing training in an intervention. The second most frequent overall reason for why clinicians pursued training in the interventions was due to their site requiring or endorsing training in the intervention method ($n = 44$). This was the most frequent response for Brain Gym, Interactive Metronome, and Therasuit. Training was sought for two because they were seen on AOTA approved provider list (Therapeutic Listening and the Listening Program). There were 19 responses for the "Other" category, which allowed clinicians to write in why they pursued training in an intervention that was not listed. The "Other" responses include: former setting endorsed the intervention ($n = 3$, Therapeutic Listening, Brain Gym, Wilbarger) the intervention was a part of SMART training ($n = 1$, Masgutova Method), the certification in the intervention was included with their OT degree ($n = 2$, for two respondents reporting Reflex Integration), the intervention was a recommended training by their OT school's fieldwork supervisor ($n = 2$, for two respondents Reflex Integration, Rhythmic Movement Training, Wilbarger), certification in the intervention was required for fieldwork setting ($n = 1$, Wilbarger), getting trained in an

intervention was suggested by a medical provider ($n = 1$, Wilbarger) and one respondent pursued training in the intervention by attending a workshop ($n = 1$, Wilbarger). One respondent listed how they pursued training instead of “why” and six respondents clicked “Other” but did not provide a narrative response.

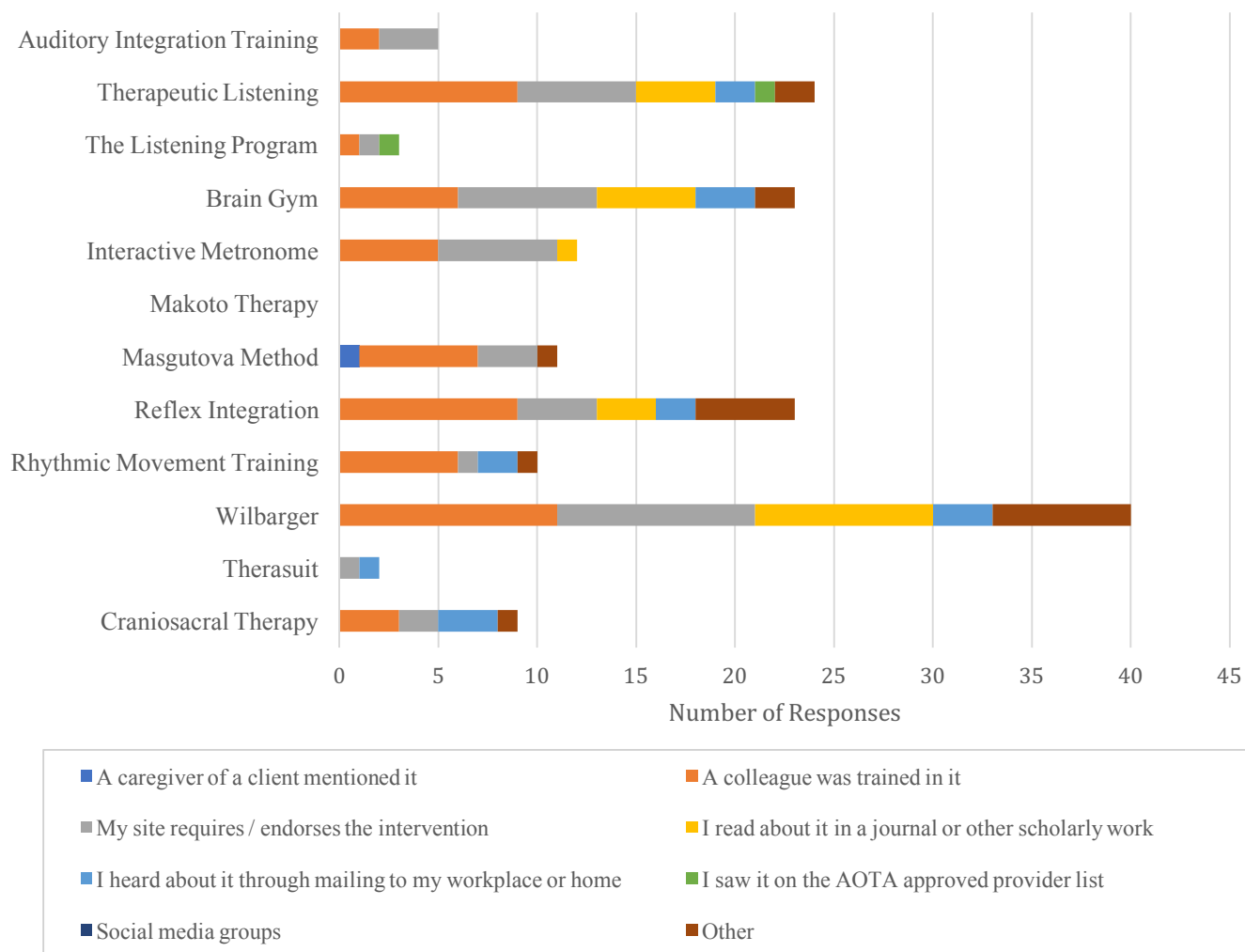


Figure 2. What Led Clinicians' to Pursue Training in the Specified Interventions. This figure displays what influenced clinicians to pursue training in a specified intervention.

Analysis of specific interventions. The following data analysis section examines the responses to the individual intervention questions (are you trained/certified to implement this intervention in practice, have you used this intervention while working with a child with ASD,

etc.) and examines their frequencies by intervention group. Four tables (Table 4 – Table 7) examine the clinician's responses to the four intervention groups (listening, movement, reflex integration, and sensory/manipulative therapies). Details are provided in the sections that follow based on categories of interventions.

For all twelve interventions, more clinicians reported seeing the intervention used with children with ASD than those who reported using it with children with ASD. Of the twelve interventions, the highest number of clinicians reported being trained in Wilbarger Protocol ($n = 40$), followed by Therapeutic Listening ($n = 24$), Brain Gym ($n = 24$), and Reflex Integration Training ($n = 23$). For six of the twelve interventions, more clinicians reported using the intervention with children with ASD than those who reported being trained in that intervention (Therapeutic Listening, The Listening Program, Brain Gym, Makoto, MNRI, and Wilbarger Protocol). The most common interventions used with children with ASD when comparing the total number of practitioners reporting being trained in the intervention to the number reporting use with ASD populations include Wilbarger Protocol (76.9%), Brain Gym (58.3%), Therapeutic Listening (50.8%), Rhythmic Movement Training (45.5%), Reflex Integration Training (42.6%), and MNRI (41.9%). Finally, for eight of the twelve interventions over 50% of the respondents on the question reported seeing the interventions used with children with ASD by other practitioners (Wilbarger Protocol, Brain Gym, Rhythmic Movement Training, Reflex Integration Training, MNRI, Therapeutic Listening, Auditory Integration Training, and The Listening Program). See Tables 3 - 6 for more details on each of these based on the intervention category.

Analysis of the listening therapies. The listening therapies analyzed consisted of Auditory Integration Training (AIT), Therapeutic Listening, and the Listening Program (TLP). For the Listening Program, more therapists reported using it as a CTM than those who said they

were trained in it. The largest number of clinicians reported being trained in Therapeutic Listening ($n = 24$) among the three listening therapies. Of those trained in any of the listening therapies, the highest percentage of those trained (29%) reported using AIT as a CTM. Table 3 displays the clinicians' responses to the survey questions concerning the listening therapies.

Table 3.

Clinicians' Responses to Survey Questions Pertaining to the Listening Therapies

Survey Question	Auditory Integration Training (AIT)		Therapeutic Listening		The Listening Program (TLP)	
	Yes	No/Unsure	Yes	No/Unsure	Yes	No/Unsure
Are you trained/certified to implement this intervention in practice?	6 (22.2%)	21 (77.8%)	24 (38.1%)	39 (61.9%)	3 (7.5%)	37 (92.5%)
To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?	1 (4.2%)	23 (95.8%)	18 (29.0%)	44 (71%)	6 (15.4%)	33 (84.6%)
Have you used this intervention while working with a child with ASD?	5 (19.2%)	21 (80.8%)	31 (50.8%)	30 (49.2%)	7 (17.9%)	33 (84.6%)
Have you seen other occupational therapists use this intervention while working with a child with ASD?	15 (57.7%)	11 (42.3%)	41 (66.1%)	21 (33.9%)	20 (50%)	20 (50%)

Note. The full survey can be found in Appendix E.

Analysis of the movement therapies. The movement therapies consist of Brain Gym, Interactive Metronome, and Makoto Therapy. More therapists reported using Makoto Therapy as a CTM than those who said they were trained in it. The movement intervention clinicians reported being the most trained in was Brain Gym ($n = 24$) as well as Brain Gym being the most utilized ($n = 35$) movement intervention used to treat a child with ASD. Table 4 displays the clinicians' responses to the survey questions concerning the movement therapies.

Table 4.

Clinicians' Responses to Survey Questions Pertaining to the Movement Therapies

Survey Question	Brain Gym		Interactive Metronome		Makoto Therapy	
	Yes	No/ Unsure	Yes	No/ Unsure	Yes	No/ Unsure
Are you trained/certified to implement this intervention in practice?	24 (38.7%)	38 (61.3%)	12 (23%)	40 (77%)	0 (0%)	6 (100%)
To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?	10 (16.9%)	49 (83.1%)	10 (20%)	40 (80%)	2 (33.3%)	4 (66.7%)
Have you used this intervention while working with a child with ASD?	35 (58.3%)	25 (41.7%)	12 (23.5%)	39 (76.5%)	2 (33.3%)	4 (66.7%)
Have you seen other occupational therapists use this intervention while working with a child with ASD?	46 (76.7%)	14 (23.3%)	22 (42.3%)	30 (57.7%)	2 (33.3%)	4 (66.7%)

Note. The full survey can be found in Appendix E.

Analysis of the reflex integration therapies. The three reflex integration therapies consist of the Masgutova Method (MNRI), Reflex Integration Training, and Rhythmic Movement Training (RMT). The highest number of clinicians reported being trained in Reflex Integration ($n = 23$) among the three reflex integration therapies. Of those trained in any of the three reflex integration therapies the highest percentages of therapists reporting using them as a CTM were Rhythmic Movement Training (28.6%), MNRI (25.8%), and Reflex Integration Training (25%). Table 5 displays the clinicians' responses to the survey questions concerning the reflex integration therapies.

Table 5.

Clinicians' Responses to Survey Questions Pertaining to the Reflex Integration Therapies

Survey Question	The Masgutova Method (MNRI)		Reflex Integration Training (RIT)		Rhythmic Movement Training (RMT)	
	Yes	No/Unsure	Yes	No/Unsure	Yes	No/Unsure
Are you trained/certified to implement this intervention in practice?	11 (34.4%)	21 (65.6%)	23 (42.6%)	31 (57.4%)	10 (45.5%)	12 (54.5%)
To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?	8 (25.8%)	23 (74.2%)	13 (25%)	39 (75%)	6 (28.6%)	15 (71.4%)
Have you used this intervention while working with a child with ASD?	13 (41.9%)	18 (58.1%)	23 (42.6%)	31 (57.4%)	10 (45.5%)	12 (54.5%)

Have you seen other occupational therapists use this intervention while working with a child with ASD?	22 (71%)	9 (29%)	38 (71.7%)	15 (28.3%)	16 (72.7%)	6 (27.3%)
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Note. The full survey can be found in Appendix E.

Analysis of the sensory/manipulative therapies. The three sensory/manipulative therapies include the Wilbarger Protocol, Therasuit, and Craniosacral Therapy. More practitioners reported using Therasuit as a CTM than those who said they were trained in it. The highest number of clinicians reported being trained in the Wilbarger Protocol ($n = 40$) out of the three sensory/manipulative therapies. The greatest percentage of those trained in any of the three sensory manipulative therapies reported utilizing the Wilbarger Protocol. See Table 6 for the clinicians’ responses to the survey questions concerning the sensory/manipulative therapies.

Table 6.

Clinicians’ Responses to Survey Questions Pertaining to the Sensory/Manipulative Therapies

Survey Question	Wilbarger Protocol		Therasuit		Craniosacral Therapy	
	Yes	No/Unsure	Yes	No/Unsure	Yes	No/Unsure
Are you trained/certified to implement this intervention in practice?	40 (62.5%)	24 (37.5%)	2 (18.2%)	9 (81.8%)	9 (23.7%)	29 (76.3%)
To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?	19 (29.7%)	45 (70.3%)	3 (27.3%)	8 (72.7%)	3 (8.1%)	34 (91.9%)

Have you used this intervention while working with a child with ASD?	50 (76.9%)	15 (23.1%)	2 (18.2%)	9 (81.8%)	6 (15.8%)	32 (84.2%)
Have you seen other occupational therapists use this intervention while working with a child with ASD?	61 (95.3%)	3 (4.7%)	5 (45.5%)	6 (54.5%)	14 (36.8%)	24 (63.2%)

Note. The full survey can be found in Appendix E.

Secondary analysis of interventions by demographic characteristics. Chi-square analyses between the demographic information (question #2 through question #9) and the individual intervention questions were completed to examine for significant interactions (i.e., examining the relationship between the number of years of occupational therapy practice and being trained in Therapeutic Listening). For many of the significant interactions found, the N's were low, and the chi-square expected frequencies were less than five so that the chi-square analyses should be read with caution and the approximation may be inaccurate. To help with N's for the number of years of experience concerning pediatric and general occupational therapy practice, survey options were combined for analysis. For example, the options of 0 – 5 years and 5 - 10 years were combined into one category entitled “0 - 10” years of experience. The same was completed for 10 – 15 years and 15 – 20 years.

There were no significant interactions found for many of the chi-square analyses. There were no significant interactions based on education level, current position in occupational therapy practice, region of practice, knowledge of CTMs, and which interventions practitioners have heard of and/or used before. There were significant interactions found for the number years of general occupational therapy practice therapists had, the number of years of pediatric specific

experience, the amount of their time practitioners spend treating a child with ASD, and primary place of practice for the interventions.

Occupational therapy practitioners with more experience (10+ years) practicing in pediatrics specifically were more likely to be trained in Brain Gym than therapists with less pediatric experience (10+ years) ($\chi^2(2) = 8.04, p < .05$). Occupational therapy practitioners with more general occupational therapy experience (10+ years) ($\chi^2(2) = 10.35, p < .05$), and more pediatric-specific experience (10+ years) ($\chi^2(2) = 10.82, p < .05$), were statistically significantly more likely to be trained in the Wilbarger Protocol than occupational therapy practitioners with less experience. Therapists with more pediatric experience (10+ years of pediatric experience) were statistically significantly more likely to utilize the Listening Program ($\chi^2(2) = 6.04, p = .05$) with a child with ASD than those with fewer years of experience. Practitioners with more overall occupational therapy experience (20+ years) ($\chi^2(4) = 9.26, p = .05$) as well as more pediatric-specific experience (20+ years) ($\chi^2(4) = 9.26, p = .05$) were statistically significantly more likely to utilize Therasuit as a CTM than newer therapists.

Newer therapists (experience less than 10 years) were statistically significantly more likely to see other practitioners utilize the MNRI ($\chi^2(2) = 8.29, p < .05$) and Reflex Integration Therapy ($\chi^2(2) = 6.70, p < .05$) to treat children with ASD than more experienced (10+ years) general practitioners. Clinicians who work in outpatient and private practice settings were statistically significantly more likely to use the MNRI to treat a child with ASD than clinicians who work in a hospital, school, and home-care setting ($\chi^2(2) = 15.98, p < .05$). Occupational therapy practitioners who spend at least 60% of their intervention time treating a child with ASD were statistically significantly more likely to apply RMT as a CTM ($\chi^2(4) = 11.31, p < .05$).

Focus Group Results

Participants. Participants were 10 registered occupational therapy practitioners currently practicing in pediatrics in Minnesota. There were five participants in each focus group. Each focus group session lasted approximately two hours, was audio-recorded, and later transcribed with the program, Panopto. To ensure anonymity, participants were given a number (numbers 1-5 for the first focus group and numbers 6-10 for the second focus group), and every time they responded, they would state their number before their response. Thematic analysis was conducted on the transcribed data following the principles of the scissor-cut technique described by Stewart et al., (2007).

Three themes emerged from the coding for the research questions organized around the Level I and II codes: (1) knowledge and use of evidence-based practice; (2) current practices with the specified interventions in Minnesota; and (3) continuing education needs and future direction for pediatric practice. The level I codes identified for each Level II (topic) code can be found in Appendix I. The topics linking codes were initially created by the student researcher, which were then reviewed by the faculty advisor. The emerging themes are discussed below.

Knowledge and use of evidence-based practice. Four key themes emerged as related to knowledge and use of evidence-based practice. The first was that multiple participants mentioned that evidence-based practice is not only utilizing peer-reviewed research or scholarly evidence but combining what you have read with your clinical experience. For example, participant #3 stated “I depend a lot on what has worked for me in the past and comparing that with what's current in the literature” and participant #6 stated “I think clinical expertise plays a lot into it because sometimes the research stuff doesn't always support what you're doing, but you see the results.” Participant #8 stated how insurance companies and doctors rely on peer-

reviewed research with, "...peer-review journals is what...the insurance companies are looking for and what the doctors are looking for."

The second theme was that even though there was an acknowledgement of the importance of scholarly evidence, many participants indicated that there is a lack of evidence and that they often heavily rely on anecdotal knowledge from themselves or colleagues as well as information from the companies selling these intervention methods to support what they are doing in practice. Participants mentioned that occupational therapy practice tends to take a more anecdotal direction when it comes to treating children with ASD. "It depends on what you call 'evidence-based practice.'... peer-review journals is what of course the insurance companies are looking for and what doctors are looking for... and we just don't have access to that...so some of the...things that we do are a little bit anecdotal... it goes away from the scientific model." (Participant #8). Participant #2 stated their reasoning for using the specified interventions though they don't have evidence to support their use with children with ASD "...they're used because even though the evidence isn't behind them...through your training or through your use with kids you find them beneficial so then...they just are still being used." Some participants did note some surprise to hearing the twelve specified interventions are not evidence-based or harmful due to the websites of the creators of these interventions saying otherwise. "What does surprise me a little bit is that... a lot of these interventions like websites or like research...will tell you... differently" and "What I am surprised that what you said is that some of them are harmful for children." (Participant #1 and participant #4). Participants have read these interventions are effective, and read successful case studies on the creators' websites. "We are dependent...upon the private companies that say 'these are really good things and do this'...there just really isn't many alternatives." (Participant #3).

A third theme was that many participants noted reliance on training and continuing education provided by or funded by their work setting or colleagues to determine the interventions and evidence-based practices they use. For example, participant #3 stated "...in terms of Brain Gym...our district paid for all the OTs in our district to be trained in it," and participant #6 stated "Therapeutic Listening and...Interactive Metronome I was trained in only because it was offered at the clinic and they needed a certain amount of people...to do it. These aren't programs that my school district would send me to trainings on or...not allow." For a few participants, they garnered knowledge about these interventions and began using these interventions through experiences in their occupational therapy educational program. "...one of my fieldwork supervisors was very much into sensory integration ... so I learned a lot of like about Rhythmic Movement Training, Reflex Integration... through her ...and...that has opened the door for me to other alternative types of...interventions..." (Participant #1). Participant #3 stated, "I think Reflex Integration for me was way back in college...it was just part of our neuro-anatomy class." Finally, in addition to the administration and colleague influences on use, participants acknowledged the influence based on parent questions and comments. "It's been requested by parents (*Wilbarger Protocol*) from...based on private clinic recommendations" and "I think talking to parents...can be...similar to talking to a manager." (Participant #3 and participant #5).

A fourth theme that emerged was related to the many barriers participants noted to being evidence-based in their current practice. One barrier was limited access to current research and evidence, "But again as a practitioner working ... I don't have always have access to the current literature" (participant #3) and "Because I work in the school district...we don't have trainings that are provided by our school district that would really relate to what an OT does." (Participant

#3). Another barrier that was noted was lack of time and money as resources needed to stay evidence-based. Participant #6 stated “A lot of it’s just access. I can’t afford to pay for AJOT. I can’t afford to pay for this journal I can’t get this journal” and “I always chose the cheapest easiest things, which weren't always related to what I needed to know as an OT working in the schools.” Concerning time, participant #10 stated “the biggest things as a young professional is just...time and affordability. There are a lot of continuing education things that I’d like to do...but just the time to get to those things and also fulfill...my professional responsibilities and a lot of the things that come on top of being in a clinic or in a school...by the end of the day...it’s just not very feasible” and participant #9 stated, “It’s not part of my regular daily practice because of all the responsibilities.” Participants noted that there is a large cost to formal training for many of these and other continuing education opportunities and it is often difficult to determine what would be most valuable. “I don't think...if it wasn't there I don't know that I'd seek it out...it was just there and a resource and...being in that particular setting (*school*) there's not a lot of funding to make a lot of choices.” (Participant #10).

Current practices with the specified interventions in Minnesota. Five key themes were identified as related to the use of the 12 interventions in practice in Minnesota. The first is that practitioners are most often using the interventions as preparatory methods and all intervention methods discussed in the focus group by participants (The Listening Program was not mentioned as a method) were identified by at least one participant as a preparatory method. Along with the prevalence in the use of the interventions as preparatory methods, many practitioners reported the importance of education and training for families or other team members to follow-through with use of this in the home or other settings as part of their intervention practices. See Table #7 for more details on the frequency with which each of the

twelve interventions was identified as utilized in each of the five types of intervention methods for occupational therapy practitioners (as defined in the Occupational Therapy Practice Framework, AOTA, 2014, pg. S29-S31). “Therapeutic Listening, would be a preparatory method but also education...if...explaining to parents why it's important, why we're doing it and...if there's a home program component, explaining to them what the home program is and what they should see...” and “Brain Gym... is informally used a lot by myself as well as...speech therapists, special education teachers...I'd say...probably used more as like a preparatory method.” (Participant #7 and participant #10). In addition, participants noted at times many of these were used as preparatory methods for attention, regulation, and to build to participation in activities or meaningful occupations rather than actually used as an occupation or activity. “I think particularly in things like Wilbarger Protocol that needs to be ... administered over a certain time period and um like even Interactive Metronome and Reflex Integration types of ... interventions ... even Interactive Metronome to a degree ... if you are taking that away from a clinic and into a home ... there's a lot of education there around ... what to do, what it is, how to administer it, what is safe, not safe ... I use a lot of those as preparatory methods ... to accomplish things like ... foundational skills as well as to bridge to more challenging tasks” (participant #1). Three interventions were noted as sometimes being used as group intervention, Makoto, Therasuit, and Brain Gym (as a “whole classroom activity” (participant #2)). Participant #6 stated “we also would have two clients going at it (*Therasuit*) at the same time. Sometimes...we do group with it and group activities while doing that.” Advocacy was mentioned in regards to advocating to practice site administration, parents, and payers for the use of these interventions in practice by two participants, but not that the interventions were used as advocacy. “I think advocacy is a big thing as I start to build my practice into more alternative

types of things like Craniosacral, Reflex Integration, and things like that ... so I've been ... needing to do ... advocacy to my boss on how ... this would be beneficial and to my coworkers and parents..." and "I do advocate for some of these...treatment protocols with parents but it would have to happen in the private setting." (Participant #1 and participant #3).

Table #7.

Type of Occupational Therapy Intervention Utilized with 12 Identified Interventions

Type of OT Intervention	Intervention	Frequency
Occupations and Activities	Auditory Integration Therapy	1
	Therapeutic Listening	1
	Therasuit	1
Preparatory Methods	Auditory Integration Therapy	1
	Therapeutic Listening	4
	Brain Gym	5
	Interactive Metronome	4
	Makoto Therapy	1
	MNRI	1
	Reflex Integration Training	2
	Rhythmic Movement Training	1
	Wilbarger Protocol	7
	Therasuit	1
Craniosacral Therapy	2	

Education and Training	Therapeutic Listening	3
	Interactive Metronome	3
	Reflex Integration Training	2
	Rhythmic Movement Training	1
	Wilbarger Protocol	6
	Therasuit	1
	Craniosacral Therapy	1
Advocacy	Reflex Integration Training	1
	Craniosacral Therapy	1
Group Intervention	Brain Gym (whole classroom)	2
	Makoto Therapy	1
	Therasuit	1

A second theme was that many participants acknowledged that a variety of the interventions were not being used with fidelity in practice. “I would say it's probably not being used (*Brain Gym*) to fidelity or the way that it should or was designed to be used...people are picking and choosing...what would work for them...in the school setting.” (Participant #10) “In the clinic, it's more...set up...with families...might do it (*Wilbarger*) at the clinic, and then families are doing it...every two hours at home” and “you may use parts of them, but that’s not your main intervention.” (Participant #9 and participant #6).

A third theme was related to where these interventions are commonly used (i.e., clinical and school-based settings) and the high variability about the availability of the tools and resources and how they are used in various settings. Participants stated that not many of these interventions are used in schools. "...in the school... setting, we don't use as many of these...as long you can justify as long as the child is making progress towards their goals ... then you're fine...I feel like a lot of the...therapists are using them they're getting good results" and "I was trained in (*Therapeutic Listening and Interactive Metronome*) only because it was offered at the clinic and they needed a certain amount of people...to do it. These aren't programs that my school district would send me to trainings on or...not allow." (Participant #6 and participant #8). Participants have stated they have only used some of the interventions in a clinic setting as opposed to a school-based setting. "...in a clinical setting, they seem to believe in it because they see good results, but in the school setting we don't have brushes (*Wilbarger Protocol*)" and, "...when I worked in a clinic, I used to be able to go to a lot more trainings and I went to trainings like Wilbarger and Craniosacral, which I still use in the schools" (Participant #6 and participant #5). "...we have only used it (*Interactive Metronome*) in the clinic..." (Participant #7). Additionally, there were comments about how these were used in the home setting. "...just like in the clinic setting, the child will use it (*Therapeutic Listening*) at home for two times a day for thirty minutes..." (Participant #4).

Participants also noted the difference in quality of occupational therapy throughout Minnesota. "...there's a lot of variation of quality in school-based practice. I think there's a lot of variation of quality in outpatient clinics" and, "...there's also situations that I've seen of students that have private therapies that...you know...everybody that goes to this particular place gets

brushing (*Wilbarger Protocol*), or everybody is gonna do the Listening Program.” (Participant #8 and participant #10).

A fourth theme was that many of these interventions are used in practice because the work settings have provided training (formally or informally), provide access to the tools and resources for the interventions, or support therapists going out and getting formally trained in these interventions. “I don’t have the formal training but...using Brain Gym as a tool was something that everybody did before I even started...at the...particular district” and, “similar to others in the Wilbarger Protocol except it was not like a formal training. I’ve been trained by those who have gone to the training.” (Participant #10 and participant #7). Work settings providing access in terms of both the tools to provide the intervention but also the resources to be trained in them appeared to be a large factor in their use. “I went through the formal training for Interactive Metronome because the clinic...had the program and wanted everyone...to go through the training” and “Reflex Integration...I’ve just had...information from people that have been trained in it. I have not gone through the formal training.” (Participant #9 and participant #8).

The final theme related to wording used in documentation and billing to ensure reimbursement for services when these interventions are used. Participant #2 stated “...if MA were to deny something we don’t...as the OT even really see that...the billing department in the district takes care of all of that” and “...I would look at those prior to doing the intervention to see if it is ... that would be covered (*by insurance*). If it wasn’t we look at other ways that we could embed it...” (Participant #6). Often, participants mention they bill these interventions under a certain code such as therapeutic activities and don’t mention the name of the intervention. “...rather than calling it ‘Therapeutic Listening’ we would bill it under a

therapeutic activity or some of the other underlying skills that we're addressing" and "I bill under...the code of 'Therapeutic Activities'...for most of these...as a sensory prep...in my notes I would say this is a 'sensory prep' or for whatever...kind of functional goal I am looking to achieve." (Participant #2 and participant #1). Participants also mentioned they do not bill the interventions as "sensory" due to the lack of coverage. Participant #1 stated "...there is one insurance company that we currently work with that does not...accept or qualify children for...only sensory-based activities...we've been advised to...not write... 'sensory'" and "a lot of times embedding it with other functional activities and billing for those activities, especially with Therapeutic Listening." "...same as number one...kind of avoiding sensory wording in a lot of documentation...to make sure it gets covered." (Participant #4). Participants were told by their workplace to not include the intervention treatment methods into their documentation. "...we have been told not to use that (*MNRI*) as something in our daily notes as well." (Participant #8).

Continuing education needs and future direction for pediatric occupational therapy practice. Four key themes were found regarding continuing education needs and the future of pediatric occupational therapy practice in Minnesota. The first theme was that participants mentioned having a heavy reliance on professional organizations for continuing education opportunities and research, with some noting it was not inherently their responsibility to further research. "...I would like to see...whether it be MOTA or... St. Kate's ... at least provide some...leadership to...in the field...in areas that we should be...knowledgeable about and I don't know what those areas are because I don't...that's not really my area of expertise. I just work with kids in a school, and I'm...I have a lot of other things going on in my life...I'm not sure that...I don't want it to be my job to stay on the forefront." (Participant #3). Participant #3 also noted concern regarding the lack of accessibility to trainings, which then results in reliance on private

companies for trainings. "...without the... local colleges providing the training for us we are dependent then upon the private companies...there just really isn't many alternatives."

(Participant #3).

The second theme is many current occupational therapy practitioners are not dedicated to having evidence-based practice as a priority or are not willing to put in the effort to remain evidence-based. To combat this, participants mention having recent graduates is helpful to combat their beliefs and moving the culture of the workplace toward being more evidence-based.

Participant #6 stated "...the people who were formally trained in specific interventions...no matter what you brought up that was their truth because they went to that class. They provided them the evidence they needed to...get their buy-in. Working with... more... newer graduates...they have no problem saying 'well why would you do that?' which I like." "...that's one benefit I found about having students from the colleges with me...the issue I have is in our district not everybody...my coworkers are willing to do that (*promoting evidence-based practices*)...it's helped me...hear what the cutting edge things are...from...new graduates."

(Participant #8). One participant noted the impact of updating the entry-level occupational therapy requirement from a master's to a doctorate, and that impact on research for occupational therapy practice. Participant #9 stated "OT is...going to the point of a doctorate being the entry-level and for a long time I...wondered 'is that necessary?' But when I think about this and as we talk about research...having that level of training...we are gonna...get more research...with more OT's with Doctorate's."

The third theme is there needs to be more research, researchers, and resources for how to be involved in research. "...there needs to be more research done about the actual interventions being used" and, "I think...probably getting some good research on our methods so that we can

get some funding for studying these things.” (Participant #6 and participant #8). ...unfortunately, there’s just not the level of...professionals in the field that are devoted to the research or can be at this point.” (Participant #8). Participant #8 also stated “...we need to continue to...being involved in research...I think that would be helpful for clinicians to know how they could do that.” Practitioners noted that they felt like they needed more training in order to be evidence-based in their practice. Participant #9 stated “...it can be overwhelming. There is a lot out there. How do you narrow down your searches and pick...so even just the training for how to be effective at evidence-based...” Participants also mentioned that there is no substantial evidence supporting interventions to treat children with ASD, which makes it difficult to decide which continuing education opportunities are worth attending. “There isn't the research to say, ‘you should really get trained in something’ or in this specific thing and ‘it will pay off’...it's just not there.” (Participant #10).

A fourth and final theme related to supports that exist in current practice being evidence-based and what practitioners felt was the most important as it relates to occupational therapy’s role in working with children with ASD. Several participants mentioned various opportunities their work settings provide for them to take time to search for evidence to address fundamental questions they have in practice. Some examples included interdisciplinary team meetings, professional learning communities (PLCs), journal clubs, and team rounds. Participant #9 stated that in the school setting “one of us might ... go find more information and share it or as a team ... PLCs ... your group is all OTs ... we did a study group ... I do try to tie into what I am already doing at work ... pick a new topic every year and get information on that ... I have some great colleagues”. In the clinic setting participant #1 stated “weekly client round meetings with our team ... discuss ... interventions specific to clients that we are working with and learn from

other co-workers' knowledge base as well." In addition to the time offered on the job to share and focus on learning specific to client needs a couple of occupational therapy specific topics were identified as areas of focus for research and education. The first was the need for a greater variety of intervention ideas and approaches for individuals with ASD beyond early childhood. "Working in the school setting and specifically with students ... in twelfth grade that have autism just look at more resources for ... later on in life. I think there's lots of support and things that schools are doing and clinics ... easy to find resources for children, but what are we doing ... and how are we supporting lifelong ... success ... I just don't think there's a lot of resources out there and you're not ... hear(ing) ... young adults or adults having a lot of interventions done with them ... to keep them successful ... an area I think we could ... society could just work on in general" (participant #10). Finally, occupational therapy specific advocacy and education for how the profession can provide distinct value to individuals with ASD is needed. "A huge part of our role is ... our skills and then activity analysis and breaking down ... functional skills and routines and what's causing the problem ... shed light on (*the real problem*) ... there's a variety of ways to address ... the problems kids are having so I think ... our way of breaking down activities, analyzing, and coming up with ... the broad range of things we can do in schools is supporting ... and ... collaborating with teams around ... functional skills and development ... giving some practical things they can do in the classroom rather than there's treating them ... every week" (participant #9) and "...in the school setting, I do a lot of training with people who aren't educated about sensory and what the senses are and proprioception and vestibular because most people...have never heard of those before and how they impact kids, which I think has helped..." (participant #6). Finally, participant #8 summed up many of the comments of others in

stating "...we need to continue to make sure that people know that OT has a lot to contribute to kids with ASD."

Chapter 5 - Discussion

The current study explored the knowledge of evidence-based practice, twelve interventions, and the continuing education needs for pediatric occupational therapy practice with children with ASD in Minnesota. An analysis of the results concerning the web content analysis, survey, and focus groups revealed five major themes: (1) general prevalence and use of the specified interventions, (2) practitioner's awareness of evidence-based practice, 3) why practitioners pursued training in a specified intervention, (4) the practitioner's utilization of the interventions with fidelity, and (5) identification of continuing education and resources needed for practitioners.

General Prevalence and Use of Specified Interventions

This study supports the notion that the twelve specified interventions are being used extensively within pediatric occupational therapy practice in Minnesota. Trends were found amongst the specified interventions. The two most frequently mentioned and endorsed interventions from the research data were Therapeutic Listening and the Wilbarger Protocol. Website content analysis and survey data support this statement, with Therapeutic Listening and Wilbarger Protocol being the most endorsed interventions on the websites of occupational therapy providers in Minnesota as well as having the highest number of clinicians reporting to being trained in them on the survey. These interventions were most endorsed in sites (one or two clinics) rather than systems (three or more sites), and within the Twin Cities, which may be due to a high number of the private clinics existing in the Twin Cities.

Notable differences were found utilizing the specified interventions in a school-based setting versus a clinic setting. During focus groups, practitioners stated that, out of the 12 specified interventions, only Brain Gym, Wilbarger Protocol, and Craniosacral Therapy are

likely utilized in school-based practice. Survey data findings include practitioners whose primary setting of practice were clinics were statistically more likely to use some of these interventions than practitioners whose primary place of practice were hospitals, and school-based settings. Focus group participants acknowledged it was easier to access and use the specified interventions more so in private clinics than school-based settings. There were more respondents and participants based in schools than clinics, which means the prevalence of the specified interventions is likely higher than thought.

Another trend noticed was years of experience in occupational therapy and utilizing one of the specified interventions. From the survey data, for three interventions (the Listening Program, Brain Gym, and the Wilbarger Protocol) more established clinicians were more likely to use these interventions when treating a child with ASD. This is congruent with the focus group data, with participants stating newer therapists being more open to questioning the use of non-evidence-based practices at their sites than seasoned therapists. This may be due to the increasing prevalence of ASD and reflect a greater awareness of evidence-based practices, a concept more frequently taught to newer graduates (Thompson-Hodgetts et al., 2018). The idea that newer graduates have a greater awareness of evidence-based practices was also evident in the focus group responses as participants indicated not really knowing where to go to obtain the best evidence to support their practice.

Trends were found regarding how these interventions are used in practice. All twelve interventions received responses related to training and use in clinical practice on the survey. Though a few interventions were not recognized by each therapist within the focus groups, all participants recognized at least one of the specified interventions as a form of intervention when treating a child with ASD and all but one intervention (The Listening Program) were discussed

as examples by participants in the focus groups. Within the survey, half of the interventions were reported as used with children with ASD by more practitioners than those who reported being trained in them. This is highly concerning because there are therapists reporting using these interventions in practice without training, which was also found in the focus group data. For example, Participant #4 stated "...Makoto we have at the clinic no training again...the person who learned about it...showed us how to use it..." and Participant #1 stated, "I wasn't formally trained but trained in a clinical setting by people who were formally trained..." The prevalence of use with these interventions is also likely much higher than reported due to more respondents noting they are seeing the interventions being implemented in practice than those using the interventions themselves, which was also found in the focus group data in which participants mentioned interventions they are familiar with because of the use of them in their practice setting by others.

The most frequent intervention method participants applied the specified interventions as were preparatory methods and education and training (as defined in the Occupational Therapy Practice Framework, AOTA, 2014, pg. S29-S31). Therapeutic Listening, Brain Gym, Interactive Metronome, and Wilbarger Protocol were most cited by participants to be used as preparatory methods, with Therapeutic Listening, Interactive Metronome, and Wilbarger Protocol often being as education and training for parents and caregivers to use in home programs. Practitioners said they utilized the interventions to address an underlying functional problem, and often use these interventions to prepare a student for an occupation or activity rather than actually use them as an occupation or activity during treatment. During the focus groups, while underlying functional deficits were noted (i.e., bilateral integration, crossing midline, decreased attention) the occupational performance outcomes being addressed were not discussed. This raises

questions about the purpose of using these interventions if occupational performance outcomes were not identified. Additionally, the specified interventions lack evidence to support their use addressing the occupations of children with ASD (Barrett et al., 2016; Garness et al., 2016; Madison et al., 2016; Thelen et al., 2016), and based on focus group data, practitioners may not be effectively treating children with ASD and their occupational participation. Finally, survey and focus group data indicated practitioners are utilizing these interventions for much of a treatment session. This indicating they are potentially spending less time using occupations as a modality for treatment and a significant portion of the intervention session utilizing preparatory methods, which are often interventions that are done with clients without their active participation (Beasley, 2017). The definition of a preparatory method or task are those “that prepare the client for occupational performance, used as *part of a treatment session* in preparation for or concurrently with occupations and activities or provided to a client as a home-based engagement to support daily occupational performance” (AOTA, 2014, p. S29). By definition, these methods and tasks often involve the practitioner administering a modality, performing or providing manual techniques, fabricating splints, and providing technology with a few preparatory methods involving the client performing a task and do not constitute large portions of an intervention session (AOTA, 2014, p. S29). Thus, questions are raised regarding the information gathered through the focus group in relation to how much of a session is really dedicated to preparatory methods administered/provided by the practitioner, how much is dedicated to preparatory methods involving client activity in tasks, and how much is spent on other methods of intervention (occupations and activities for instance)? Additionally, while using these preparatory methods, how much attention is being paid to the occupational performance outcomes targeted by the methods?

To make sure practitioners are effectively addressing the occupational participation of children with ASD, utilizing the PEOP model to examine an intervention could be emphasized. As previously mentioned, the PEOP model is an evidence-based framework that is occupation-based and primarily addresses occupational performance issues for children with ASD (Baum et al., 2015). Using the PEOP model to examine how well an intervention method addresses the occupational performance of a child with ASD can be a helpful guide for decision-making to help ensure practitioners are utilizing interventions that are occupation-based, client-centered, and evidence-based. It can also help practitioners examine in a systematic way which intervention methods are targeting which performance goals to provide data to support practice-based evidence outcomes.

Practitioners' Awareness of Evidence-Based Practice

Best practice in providing evidence-based treatments includes the implementation of knowledge garnered from both clinical expertise as well as best research evidence (Law & MacDermind, 2014). Within the focus group, many participants identified definitions similar to the definition provided by Law & MacDermind (2014) as their definition of evidence-based practice. However, they also reported more reliance on clinical experience as a legitimate source of evidence when selecting treatments for children with ASD, which is congruent with past research (Ashburner et al., 2014; Dubouloz, Egan, Vallerand, & von Zweck, 1999). A possible reason for this is the amount of years practicing post-graduation. Recent graduates are more likely to use skills needed for evidence-based practices than experienced therapists (McCluskey, 2003). This was a theme noted within the focus groups, with participants indicating that in their experience newer graduates question some of these interventions more than seasoned therapists. Postgraduate training is also associated with higher use of research in occupational therapy

practice (Thomas & Law, 2013). Also within the focus groups, participants mentioned they read about these interventions in journals but often these interventions are not found in peer-reviewed journals or have no published studies examining their effects on the occupations of children (see Appendix B). Practitioners may be unaware that what they are reading is not evidence-based, and may attempt to implement this information in occupational therapy practice. This can result in further isolating the occupational therapy profession from adopting evidence-based practices, which historically, has already been more difficult for the profession to accomplish compared to other professions (McCluskey, 2003). The decreased adoption of evidence-based practices in the profession of occupational therapy will continue to heighten the controversy around sensory-based approaches.

From the focus groups, it was clear that school-based practitioners had dedicated time in professional learning communities to share evidence and monitor and adapt their practices. Some clinical settings had less clear opportunities. However, all practitioners in the focus group voiced that more support for access to resources and evidence would benefit their practice.

Why Practitioners Pursued Training in a Specified Intervention

Trends were found regarding how clinicians pursued training regarding the specified interventions. Through survey analysis, the most frequent reasons for pursuing training in a specified intervention for clinicians was due to knowing a colleague was trained in it and their setting requiring training or endorsing training in an intervention method. This was corroborated in the focus groups with many practitioners explaining that their work sites provided on-site or on-the-job training (formal or informal) in the use of many of these interventions. “It depends on what you call ‘evidence-based practice.’ ... peer-review journals is what of course the insurance companies are looking for and what doctors are looking for ... and we just don't have access to

that...so some of the...things that we do are a little bit anecdotal... it goes away from the scientific model” and “...they're used because even though the evidence isn't behind them ... through your training or through your use with kids you find them beneficial so then...they just are still being used.” (Participant #8 and participant #2). This is concerning, knowing research (Ashburner et al., 2014; Dubouloz et al., 1999) has shown occupational therapy practitioners have emphasized colleagues and clinical expertise over research evidence, which the focus group data echoed.

Participants mentioned that practice settings encouraged training in an intervention by paying for it which made the training more accessible, especially with the presence of many barriers to continuing education opportunities. Knowing therapists are highly influenced by their colleagues and supervisors, it is up to the therapists' discretion to have conversations about the negative consequences of utilizing interventions that are not evidence-based and using treatment methods without formal training. Mentor practitioners not knowledgeable in evidence-based practice may encourage their own status quo practice, which can inhibit practitioner's ability to implement evidence-based practices in their work setting (Thompson-Hodgetts et al., 2018). Managers of occupational therapy practitioners need to encourage incorporating evidence-based practices into their workplace and be role models who routinely use published research to inform their practice (McClusky, 2003).

Other reasons for pursuing training were the participants' education and requests from parents of clients. Participants stated they pursued training in an in intervention (e.g., Reflex Integration) through their occupational therapy program. One of these participants noted that this was decades ago and appeared surprised to still see it listed. Occupational therapy graduate programs should reflect on how well they are preparing their students to become proficient

enough in evidence-based processes to determine what interventions may be best utilized to treat their patients. Regarding the parents of clients, focus group participants mentioned parents have requested these interventions (e.g., Wilbarger Protocol), even though this treatment method has little or no effect, has been a frequent issue in pediatric practice (Watling & Hauer, 2015). Clearly communicating the risks and lack of evidence supporting the use of an intervention must occur with parents if we are to provide ethical, family-centered care (Kurtz, 2008).

Utilizing the Specified Interventions with Fidelity

A common trend observed from survey and focus group results was the lack of knowledge of CTMs. Occupational therapy practitioners are one of the primary providers of treatment to children with ASD and CTMs are a method of providing care to children with ASD. And yet, the results show that more participants may not have knowledge of CTMs than those who are aware of them. A component of a CTM is that it occurs over a longer period (e.g., six months) when treating a child with ASD (Odom et al., 2010). From the survey data for three interventions (The Listening Program, Makoto Therapy, and Therasuit), more therapists are using the interventions as a CTM than those who reported being trained in them. This is not only concerning because more practitioners are utilizing these interventions with children with ASD without formal training, but Therasuit is typically used as an intensive three-week program and not a long-term intervention, which is how some participants have reported using the intervention (Therasuit LLC, 2006a). Many of the auditory interventions (The Listening Program and Therapeutic Listening) are being utilized up to 40 weeks at a time (as CTMs), though they have not been shown to effectively address the occupations of children with ASD (See Appendix B).

Through the survey and focus group data, it was discovered that several interventions are not being used as intended in practice. For instance, many practitioners verbalized that the Wilbarger Protocol is not often used at the 6 times a day for 6 weeks method, which is how the Wilbarger Protocol was intended to be used (Weeks et al., 2012). Additionally, many therapists reported using various interventions as preparatory activities, but then also indicated that the intervention would last for 30 to 60 minutes of the session as per the prescribed protocol (Therapeutic Listening and Interactive Metronome). These percentages were not similarly reflected in the survey data as the majority of practitioners reporting the use of either of these interventions reported utilizing them for 25% of the intervention session or less. This is either an indication that therapists are using them to the prescribed protocol or do not feel they are large percentages of the intervention because they are used alongside other interventions, which may or may not be to fidelity. For five of the interventions, at least one survey respondent indicated using the intervention for 50% or greater amount of the intervention duration. For two of these interventions, Therapeutic Listening and Wilbarger Protocol, there are clear prescriptions of time for their utilization. As mentioned previously, Therapeutic Listening is a 30-minute time frame for use twice a day (Vital Links, 2016a). Unless treatment sessions are only 30-45 minutes in length, this intervention should not take 50% or more of the session. Wilbarger Protocol is a quickly applied intervention and should not take 25%-50% or greater than 50% of an intervention time, unless the intervention is less than 30 minutes in length (Weeks et al., 2012). Both of these raise questions about the fidelity of their use in practice. For the other three interventions (MNRI, Reflex Integration Training, and Rhythmic Movement Training), it is unclear the length of time recommended for use of each of these within a session, so fidelity is unclear.

Data from this project show that the specified interventions are not being used in a consistent manner. Practitioners are attempting to utilize them to address a functional goal for an extended amount of time (like a CTM) while other practitioners are utilizing them for a shorter duration of time (as a focused intervention practice). Also, based on the project data, the 12 specified interventions can be categorized more as SBIs than relying on ASI principles, meaning the specified interventions are not occupation-centered by nature. Past research shows SBIs have little to no effect on improving the symptoms of children with ASD and their occupational performance (Watling & Hauer, 2015). Though SBIs are preparatory in nature and many practitioners are utilizing them as such, practitioners should be using methods that have the research to support their use and have been shown to improve the occupational participation of children with ASD.

What Practitioners Would Find Helpful as Continuing Education and Resources

Practitioners stated they have a lack of access to research and journals. Participants need more continuing education opportunities outside the Twin Cities in rural areas as well as making them more affordable. “There are a lot of continuing education things that I’d like to do even through MOTA...but...the time to get to those things...the affordability...you know it’s hundreds of dollars...I think those are the biggest barriers...time and money” and “...one limiting factor...it’s...the cost...if I were to take a college course and have to pay...St. Kate’s or the U of M’s price per credit, that’s...cost-prohibitive...I always chose the cheapest easiest things...” (Participant #10 and participant #3). The profession must provide more funding for affordable high-quality evidence-based continuing education programs and resources. If not, occupational therapy practitioners will continue to be dependent on biased educational sessions and private companies as reliable sources of information, including the creators of the specified

interventions. Clinicians stated that knowing there is a lack of strong evidence supporting these interventions is not wide-based knowledge. Resources for evidence-based information can be found in Appendix M. Continuing education concerning the impact of CAMs may also be necessary, especially since even though a participant heard that all 12 specified interventions were not supported by evidence and/or were harmful, they stated “...I would love to see more of a push toward...the acceptance of and knowledge about alternative types of interventions.” (Participant #1). Guidelines for practitioners considering the use of CAMs for their pediatric clients can be found in Appendix N, and see Appendix O for a list of occupational therapy interventions for children with ASD that are supported by evidence.

With the upgraded requirement of a master’s degree (and soon an OTD) to become a registered occupational therapist, new cohorts of occupational therapy practitioners may develop more knowledge about evidence-based practices than seasoned clinicians who only have a bachelor’s degree in occupational therapy (Thomas et al., 2013). The findings support that clinicians appreciate having recent graduates in their workplace due to their increased knowledge in evidence-based practice. Continuing education opportunities on evaluating research evidence efficiently and implementing the findings are recommended as resources. Past research does support that continuing education courses (such as interactive workshops) alone can improve the use of evidence-based practice to achieve patient treatment goals and self-efficacy in doing research (Forsetlund et al., 2009).

Implications for Practice and Recommendations

Ethical implications for occupational therapy practice in Minnesota exist concerning the widespread use of interventions that are not supported by expert review groups, professional organizations, and are not effectively supporting the occupational participation of children with

ASD based on the literature. These ethical implications include obstructions of beneficence and nonmaleficence, due to practitioners not providing best practice for their pediatric clients and demonstrating concern for the well-being of their clients, which are part of the American Occupational Therapy Association's Code of Ethics (AOTA, 2015). See Appendix P for specific ethical questions raised by this project and potential methods for addressing these in practice. Therapists are saying that journals and research are important, but it's not practical to always stay up-to-date on what's current and implementing the research into practice. Access to the American Journal of Occupational Therapy (AJOT) as well as the British and Canadian Occupational Therapy Journals (BJOT and CJOT, respectively) are included within the AOTA membership. However, a low percentage (28.17%) of licensed occupational therapy practitioners across the country take advantage of AOTA membership (AOTA, 2018). Practitioners need to reflect on the importance of evidence-based practices and the value of membership in professional organizations to increase access to scholarly resources. One such resource for occupational therapy practitioners through their membership in AOTA is the Choosing Wisely campaign, an initiative AOTA recently joined (Gillen et al., 2017).

Choosing Wisely is a campaign of the American Board of Internal Medicine (ABIM) that focuses on promoting conversations between clients and practitioners to ensure that quality and appropriate care is provided (Gillen et al., 2017). The specific aims of this initiative include making sure assessments and interventions are truly necessary, supported by evidence, free from harm, and not duplicative of other tests or procedures already received by the client (Gillen et al., 2017). By joining this international campaign, AOTA recognizes the importance of taking a stand to avoid interventions and procedures that are unnecessary and inconsistent with providing health care that is high quality and cost effective (Gillen et al., 2017). Using the principles of this

campaign, occupational therapy practitioners can evaluate the interventions they use in their own practice to ensure that high quality and cost-effective care is being provided to all clients.

The amount of research for intervention choices for children with ASD can be overwhelming. This can lead to information overload and reliance on word-of-mouth suggestions rather than research evidence for their clients (Matson, Adams, Williams, & Rieske, 2013), which supports our findings. Occupational therapy practitioners must learn how to seek evidence and feel comfortable translating research into practice to provide ethical treatment for children and families. Not providing evidence-based treatment will increase the controversy regarding sensory-based approaches, which then may affect the uptake of research evidence into occupational therapy practice for children with ASD (Kadar et al., 2012). One method of examining how well an intervention method addresses the occupations of children with ASD is the PEOP model due to its focus of evaluating occupational participation and outcomes (Baum, Christiansen, & Bass, 2015). Could the PEOP model be an effective strategy for therapists to use to evaluate the benefits of an intervention? Another way of promoting interventions that are occupation-based is educating practitioners about treatments inspired by Ayers' Sensory Integration (which is occupation-centered) rather than sensory-based interventions, which are not occupation-centered by nature (such as the twelve specified interventions) (Parham & Mailloux, 2015; Watling & Hauer, 2015).

For billing, clinicians stated they took parts from the intervention, coded them as "Therapeutic Activities" or "Therapeutic Exercise" and then billed it. Not only are clinicians not using the interventions as they were intended, many school-based therapists are unaware of the repercussions of falsifying billing. Attempting to bill for these interventions and not being aware if occupational therapy services are being covered has extensive implications for occupational

therapy practice. Creating a trend where occupational therapy services are increasingly uncovered by insurance companies can devalue occupational therapy services to insurance companies, reducing their willingness to cover these skilled services for children with ASD. This includes EIDBI, a Medicare-created benefit to aid children with ASD on Medicaid in Minnesota. Occupational therapy practitioners will reduce access to occupational therapy services for low-income families if they continue to utilize these 12 interventions due to EIDBI not covering them. Support by managers of occupational therapy practitioners can help influence the change process for better documentation and billing routines.

Practitioners mentioned they heavily rely on professional organizations and institutions for research, as well as may not feel inherently responsible for furthering occupational therapy research. If occupational therapy practitioners do not feel comfortable and motivated to search for research evidence and/or do not have access to resources to supplement their practice, this can create a lack of confidence within occupational therapy practitioners in treating children with ASD. This can devalue occupational therapy to insurance companies, and reduce justification for their coverage of occupational therapy services.

Involvement in research has been shown to support the use of evidence-based practices (Thomas et al., 2013). Helping to promote the practitioner's participation in research may help to increase the use of evidence-based practice within a therapist's workplace. On-site education sessions regarding evidence-based practice may be an efficient way of increasing a practitioner's confidence, which may help overcome the barrier of lack of time barrier faced by occupational therapy practitioners (McClusky, 2003). Additionally, to increase the awareness of evidence-based practice in pediatric practice in Minnesota and elucidate this prevalent issue, planned dissemination of this thesis with occupational therapy professional groups including the

Minnesota Occupational Therapy Association (MOTA), and specifically, the Pediatrics Special Interest Group, will occur. To promote awareness and a change in practice related to how to evaluate interventions and choose interventions in an ethical manner, dissemination is planned through OT Practice and a peer-reviewed research venue such as AJOT and the AOTA conference.

Future research should further investigate why practitioners who have mixed success with these twelve interventions continue to use them. Additional foci include exploration of what the most often utilized interventions by occupational therapy practitioners are for children with ASD and to then compare the use of evidence-based interventions to non-evidence-based interventions. What does it mean when there are occupation-based interventions out there that are evidence-based and practitioners are still choosing to use interventions that are not occupation-based and evidenced-based over others? Concerning professional organizations, how can AOTA and MOTA promote interventions that are occupation-based? As a reminder, survey and focus group data showed practitioners pursued training for some of the specified interventions due to seeing them on AOTA's list of approved providers of continuing education. Due to the high number of practitioners utilizing the interventions without training and the questionable documentation and billing practices, should the Minnesota Occupational Therapy Licensure Board consider ethics in practice as a requirement for continuing education as part of its renewal process? For physical therapists and physical therapy assistants in Minnesota, their continuing education requires two hours of ethics directly concerning physical therapy practice every two years (Revisor of Statutes, State of Minnesota, 2018). While the study sample for the focus group was small, so the issues related to billing and documentation may not be that prevalent, the survey findings suggest that many clinicians are using interventions without

training. Continuing education focused on ethical practices related to choosing and using interventions could benefit a large number of practitioners across the state of MN. Finally, research needs to examine how frequent these interventions are used and implemented across the United States and internationally.

Limitations

Due to CTMs not being a common term in practice, participants and respondents may not have fully understood what a CTM consists of when answering questions related to the interventions and CTMs. We did not ask focus group participants how many years in occupational therapy practice and pediatric-specific experience they have. This information would have been useful to further explore the connection between years in practice and the likelihood of being trained in the specified interventions. Most of our focus group participants primarily worked in school-based settings, and over half of our survey respondents were school-based therapists. Due to the specified interventions being used more in private clinics rather than schools, we might not have true prevalence information concerning their use in Minnesota. The survey did not reach many occupational therapy assistants (OTA), and no OTAs participated in the focus group. OTAs work heavily in pediatric settings, and so there were missed opportunities to examine the differences in use of these practices by OTAs in comparison to OTs. Finally, while the number of survey responses were relatively large ($n = 105$), the number of focus group participants were small and only represent a small percentage of occupational therapy practitioners working in pediatric occupational therapy practice in Minnesota. Thus, we must be cautious with the interpretation due to the small size lacking generalizability.

Regardless of these limitations, an exploration of the use of non-evidence-based practices in Minnesota (and other states) has not been reported in previous studies. Therefore, this thesis

contributes new knowledge to the profession that can influence occupational therapy education and practice. A subsequent study that examines how to create an environment and culture within pediatric occupational therapy that not only continues but further promotes the use of evidence-based practices and denounces the use of non-evidence-based practices is needed.

Conclusion

Though using evidence-based practice is a hallmark of occupational therapy, the findings of this study support past research (Ericsson, 2004) that being evidence-based is not a characteristic found in all occupational therapy practitioners, including those practicing in pediatrics within Minnesota. The data support past research showing occupational therapy practitioners do frequently utilize sensory-based interventions that are not evidence-based (Thompson-Hodgetts et al., 2018). Sensory integration will continue to be a growing trend, as evidenced by it being the dominant theory guiding occupational therapy practitioners when working with children with ASD (Ashburner et al., 2014; Kadar, McDonald, & Lentin, 2012). Practitioners must reflect on the evidence base for the interventions they select for treating children with ASD, including those that are sensory-based, as well as to the extent their intervention choices address occupations (Thompson-Hodgetts et al., 2018).

This research sheds light on the many barriers facing occupational therapy practitioners in being evidence-based in their practices with children with ASD. How do we create a culture that is going to accept what occupational therapy practitioners need regarding continuing education and resources in evidence-based practice? How do we create and support this culture shift? Denouncing the use of non-evidence-based practices within a practitioner's workplace and challenging the status quo can create tension and conflict between their professional relationships (Thompson-Hodgett et al., 2018). Occupational therapy practitioners need administrative support

to help promote meaningful conversations concerning research evidence and decision making within the workplace. Managers need to advocate and respect time dedicated to research evidence within their workplace. Practitioners need to be allocated time in their schedule to routinely search for evidence if they want to be up to date on what is current best practice, which already exists in some occupational therapy departments (McClusky, 2003). From the focus groups, many school-based therapists appear to have this built in through professional learning communities, which may be another reason for the differences in practice of these interventions seen between school and clinic-based settings. How can these professional learning communities be emulated in other settings? Occupational therapy practitioners also need the proper skills to search for and implement evidence into practice and gain confidence in utilizing evidence-based practices for children with ASD.

Occupational therapy practitioners should reflect on their willingness to perform as change agents in making evidence-based methods a priority within occupational therapy practice, and how well their treatment methods are addressing the occupational participation of children with ASD. Occupational therapy practitioners must be knowledgeable about sensory interventions, their evidence-base, and their impact on occupations if occupational therapy wants to continue to perform as a relevant service for children with ASD in Minnesota.

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Appendix A

Information on the Early Intensive Developmental and Behavioral Intervention (EIDBI)

Benefit

The EIDBI Benefit is a Minnesota health care program that serves persons under the age of twenty-one who are on Medical Assistance and have a diagnosis of ASD or a related condition (MDHS, 2017a). The focus of this program is to cover the cost of medically necessary services (often occupational therapy) for children with ASD to help promote their independence and participation in family, school, and their community (MDHS, 2017a). The program covers the cost of evidence-supported treatment methods and a variety of treatment options that are interdisciplinary (MDHS, 2017a). EIDBI covered treatment modalities work to develop and maintain a child's developmental skills to improve their cognition, behavioral challenges, functional communication, self-care, social or interpersonal interaction, and more (MDHS, 2017a). The following treatment modalities a child can receive for EIDBI coverage include: (1) Applied Behavioral Analysis, (2) Developmental, Individual Difference, Relationship-based (DIR[®])/Floortime model, (3) Early Start Denver Model, (4) PLAY Project, and (5) Relationship Development Intervention (MDHS, 2017b). To deliver EIDBI services, you must be one of the five different types of providers: comprehensive multi-disciplinary evaluation (CMDE) provider, qualified supervising professional (QSP), Level I provider, Level II provider, or a Level III provider (MDHS, 2017c). Each of the three different provider types have different roles, qualifications, and responsibilities during EIDBI service delivery (MDHS, 2017c). Every EIDBI service must be provided by a qualified EIDBI provider (Level I, Level II, or Level III) under the supervision of a QSP (MDHS, 2017a).

Occupational therapists in Minnesota can be considered a Level I, Level II, or Level III provider depending on the number of hours of working with children with ASD they possess (MDHS, 2017c). Occupational therapists are unable to be a CMDE or a QSP because it is not within the scope of practice to diagnose a child with ASD (MDHS, 2017c). Occupational therapists not being a CMDE or a QSP signifies occupational therapists are unable to complete a comprehensive evaluation to determine the child's medical necessity for EIDBI services or develop an individual treatment plan (MDHS, 2017c). Occupational therapists can only deliver the individual treatment plan with a supervised and certified QSP (MDHS, 2017c).

Currently, Minnesota Department of Human Services (2017c) stated there is a shortage of EIDBI providers, which can delay or prevent a client's ability to access and receive EIDBI services. To help counteract this, the Minnesota Department of Human Services (2017c) is allowing the same EIDBI provider to complete both the client's CMDE and deliver their EIDBI services. In this case, the EIDBI provider must be enrolled with Minnesota Health Care Programs (MHCP) both as a QSP and CMDE provider (MDHS, 2017c). EIDBI services may be provided in a clinic, center, community environment, client's home, and office (MDHS, 2017a).

Appendix B

Information and Evidence Examining the Twelve Selected Interventions

Appendix B consists of the collection of research conducted examining the twelve specified interventions as well as critically analyzing the articles validity and reliability. Evaluating the evidence analyzing these twelve interventions include examining the research design, consistent and inconsistent findings, and the relevance of the research to the occupational participation for children with ASD. For all twelve CAMs, there is a strong lack of research investigating their effects on the occupations of children with ASD as well as research in published journals investigating the effectiveness of the interventions (Barrett et al., 2016; Garness et al., 2016; Madison et al., 2016; Thelen et al., 2016). Expert review groups have also made determinations on a number of the specified interventions, which can be found by their general category: listening therapies, movement therapies, reflex integration therapies, and sensory/manipulative therapies.

Evidence-Base for Selected Listening Therapies

Auditory integration training (AIT), the Listening Program (TLP), and Therapeutic Listening are three sensory-based interventions that focus on how auditory hypersensitivities and abnormalities affect a child's development (Bazyk., Cimino, Hayes, Goodman, & Farrell, 2010; Sinha, Silove., Wheeler, & Williams, 2006; Vargas & Luckner, 2016). Though these three auditory interventions claim to aid with the functioning of children, they have not been thoroughly examined for use with children with ASD (Garness et al., 2016). All three auditory interventions either have not been reviewed by expert review groups or they were investigated and not recommended as evidence-based practices (Garness et al., 2016; Myers & Johnson, 2007; Sinha, Silove, Hayen, & Williams, 2011; Wisconsin Department of Health Services,

2014).

AIT is a sound-based intervention designed by Guy Berard that proposes it's effective in improving language development, concentration, sensory stimulation, and social relationships for children with ASD (Garness et al., 2016; The Official Berard AIT Website, 2015). The theory behind AIT includes while the pediatric client is wearing earphones and listening to computer-modified music, the treatment reduces the predictability of auditory patterns and in turn reduces frequencies that cause hypersensitivity to sounds (Kurtz, 2008). Though it is heavily used for occupational therapy intervention, various professional organizations do not support the use of AIT and all have deemed AIT an experimental treatment (Garness et al., 2016; Wisconsin Department of Health Services, 2014). These organizations include the Academy of Pediatrics (Myers & Johnson, 2007), the USFDA, Association in Science for Autism Treatment (Association for Science in Autism Treatment, n.d.), the New York State Department of Health, and the American Audiology Association (Wisconsin Department of Health Services, 2014). The Educational Audiology Association (EAA) stated that in addition to AIT not proven to be an effective treatment, AIT's volume levels may harm hearing due to lack of safeguards and adverse side-effects (Wisconsin Department of Health, 2014). Likewise, AIT has been connected to a device created by Berard called the Ears Education and Retraining System (EERS), a device banned from importation by the United States Federal Drug Administration into the U.S. due to its lacking evidence of medical benefit (Garness et al., 2016; Wisconsin Department of Health Services, 2014). Utilizing AIT for an intervention session also takes up a considerable amount of time, with proponents claiming for treatment to be effective, the client should follow a strict protocol of twenty half-hour sessions and twice daily for ten days (Kurtz, 2008).

TLP is a music-based intervention created by Advanced Brain Technologies (ABT)

(Advanced Brain Technologies [ABT], 2016a) and ABT proposes TLP can mend auditory processing problems and improve communication, social and emotional regulation, motor coordination, and executive functioning (Garness et al., 2016; Vargas & Lucker, 2016). Many of the researchers investigating the efficacy of TLP are either distributors/producers of TLP, and many of the case studies found were promoted on ABT's website (ABT, 2016b; Esteves, Stein-Blum, Cohen, & Tischler, 2009; Garness et al., 2016; Gee, Thompson, Pierce, Toupin & Holst, 2015; Gee, Thompson, & St. John, 2014; Jeyes & Newton, 2010; Lucker & Doman, 2015; Vargas & Lucker, 2016). Though there is a lack of research investigating the effects of TLP on the occupations of children (Francis & Banai, 2011; Garness et al., 2016; Gee et al., 2015; Vargas & Lucker, 2016), ABT is an approved provider of continuing education for the American Occupational Therapy Association (AOTA) (American Occupational Therapy Association [AOTA], 2013). Additionally, the American Academy of Pediatrics does not recommend TLP as an evidence-based intervention (Myers & Johnson, 2007).

Therapeutic Listening is a music-based intervention created by Vital Links that combines music with movement to improve individuals with sensory processing deficits (Bazyk et al., 2010; Vital Links, 2016a; Wisconsin Department of Health Services, 2014). Though there have been single-case studies documenting improvements after the use Therapeutic Listening (i.e. Vital Links, 2017) these findings are perceived weak due to not being published in peer reviewed journals (Case-Smith & Arbesman, 2008; Garness et al., 2016; Wisconsin Department of Health Services, 2014). Sheila Frick, the founder of Vital Links, does have many research studies available through their website including her own (Vital Links, 2016b), but several of these studies were not accessible for further review via other databases (Garness et al., 2016). One study was showcased on AOTA's website, but Frick is an author, the study has a small sample

siz, and it was a poster session, not a journal (Wilbarger & Frick, 2017). There are no peer-reviewed journal articles found evaluating Therapeutic Listening and its effectiveness for improving the occupations and participation of children with ASD (Wisconsin Department of Health Services, 2014). The WTIAC recommends that Therapeutic Listening to not be implemented in practice due to it being considered an experimental treatment and/or potentially harmful, and the American Academy of Pediatrics does not recommend Therapeutic Listening as an evidence-based intervention (Myers & Johnson, 2007; Wisconsin Department of Health Services, 2014).

Evidence-Base for Selected Movement Therapies

Brain Gym, Interactive Metronome, and Makoto Therapy are three movement-based interventions that target coordination, physical stimulation, and motor responses through the method of movement (Hilton et al., 2014; Hyatt, 2007; Kim, Bo, & Yoo, 2012). These three interventions, like the auditory interventions above, have not been thoroughly examined for their effectiveness in addressing the occupations of children with ASD (Thelen et al., 2016). All three interventions either have not been reviewed by professional organizations or they have not been recommended as an evidence-based intervention (Myers & Johnson, 2007; Thelen et al., 2016; Wisconsin Department of Human Services, 2016a).

Brain Gym was created in the 1970s by Dennison and Dennison and proposes that by activating a series of movements (such as crawling and drawing), this will in turn activate and restore neural pathways to promote better learning, attention, and concentration (Dennison and Dennison, 1994; Kurtz, 2008). Though Brain Gym suggests that it improves motor learning, executive functioning, and academic performance, the lack of research examining Brain Gym is limited and inconclusive (Hyatt, 2007; Thelen et al., 2016). Only five peer-reviewed articles

have been published (Cammisa, 1994; De los Santos, 2002; Khalsa, Morris, & Sift, 1998; Sift & Khalsa, 1991; Watson & Kelso, 2014) and only one examined the effects of brain gym for children with Autism, which did not yield an improvement in academic engagement (Thelen et al., 2016). These articles also contain serious methodological flaws, including small samples sizes, professional biases (primary researcher of the study is a distributor of Brain Gym), not containing a control group, or examining performances differences among groups prior to intervention (Cammisa, 1994; De los Santos, 2002; Khalsa et al., 1998; Sift & Khalsa, 1991; Thelen et al., 2016; Watson & Kelso, 2014). Brain Gym does not have any substantial research or sound evidence to support its claims in addressing the occupations and participation of children with ASD (Hyatt, 2007; Thelen et al., 2016).

Interactive Metronome (IM) is an intervention that uses timing and rhythm to improve cognition, communication, sensory and motor performance (Interactive Metronome, 2016a; Koomar et al., 2001). IM is designed to help train the brain to sequence, plan, and process information more efficiently through repetition of interactive exercises (Kurtz, 2008). IM has over 30,000 certified providers in the United States and Canada and the equipment required for IM costs approximately \$1600 (Interactive Metronome, 2016b). Ten studies were found that focused on children and three examined the effects of IM on children with ADHD, but not with children with ASD (Cosper, Lee, Peters, & Bishop, 2009; Kim, Bo & Yoo, 2012; Shaffer et al., 2001; Thelen et al., 2016). Although the results of these three studies (Cosper et al., 2009; Kim et al., 2012; Shaffer et al., 2001) supported the use of IM with children with ADHD, they all had their inconsistencies or flaws in research design (Thelen et al., 2016). Some of these limitations include not having a randomized study (Kim et al. 2012), having extremely small samples sizes (Cosper, et al., 2009; Kim, Bo & Yoo, 2012; Shaffer et al., 2001), not having a control group

(Casper, et al., 2009; Kim et al., 2012), and not focusing on functional performance (Casper et al. 2009; Thelen et al., 2016). IM has either been not reviewed by expert review groups or has not been recommended as an evidence-based intervention for children with ASD (Myers & Johnson, 2007; Thelen et al., 2016).

Makoto Therapy uses exercise in the form of performance training to improve fine motor integration, strength, manual dexterity, and bilateral coordination and was created in 1993 (Hilton et al., 2014; Makoto USA, n.d.). The amount of research simply examining Makoto Therapy is limited, with only two studies found (Hilton et al., 2014; Hilton et al., 2015). investigating the effects of the Makoto Arena for children with ASD (Thelen et al., 2016). Though these two studies (Hilton et al., 2014; Hilton et al., 2015) reported changes in motor coordination and executive functioning in their clients, both studies were completed by the same investigator, had small sample sizes, and no control groups (Thelen et al., 2016). Researchers have yet to replicate the findings produced by Hilton et al. (2015) and most of the limited research found are not located in peer-reviewed journals but showcased on Makoto USA's website (n.d.). Though general exercise may provide benefits to social interaction, enjoyment, and behavior regulation for children, the efficacy of Makoto Therapy has not been reviewed by many professional review groups except for one (Association for Science in Autism Treatment, n.d.; U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services, 2010; Wong et al., 2013). That one expert review group, the American Academy of Pediatrics, deemed Makoto Therapy as limited or flawed and is not recommended as an evidence-based intervention (Myers & Johnson, 2007; Thelen et al., 2016). Makoto Therapy is an expensive intervention (up to \$1200 for rental), and further research is needed to evaluate the effectiveness of this form of CAM on the occupations and participation of children with ASD

before being administered as a treatment (Thelen et al., 2016).

Evidence-Base for Selected Reflex Integration Therapies

Masgutova Method (MNRI), Reflex Integration, and Rhythmic Movement Training (RMT) are three reflex integration therapies that all aim to reinforce and integrate primary motor reflex patterns within their participants (Chinello, Gangli, & Valenza, 2016; Masgutova, Akhmatova, Sadowska, Shackelford, and Akhmatov, 2016; Wisconsin Department of Health Services, 2015). These three interventions claim to improve components of a child's participation, such as academic performance, sensory processing, and motor control (Jordan-Black, 2005; Masgutova et al., 2016; McPhillips, Hepper, & Mulhern, 2000), but do not have sufficient research to support their claims (Barrett et al., 2016). All three interventions either have not been reviewed by professional organizations or they have not been recommended as an evidence-based intervention for use with children with ASD (Barrett et al., 2016; Myers & Johnson, 2007; Wisconsin Department of Human Services, 2016a).

MNRI is a reflex integration intervention created by Svetlana Masgutova in 1989 and proposes to improve neurological function to improve behavioral and physical development, communication, and cognition (Masgutova Foundation (MF), 2016; Svetlana Masgutova Educational Institute (SMEI), 2016a). Masgutova's theory is that certain motor concepts or reflexes are not fully developed with children with ASD and disabilities, and MNRI works to train the child with developmental reflexes which in turn, will reduce the deficits of ASD or the disability they have (Office of Administration Hearings, State of California, 2014; Masgutova, et al., 2016). The affordances to implement MNRI as a form of treatment are currently not covered by insurance (SMEI, 2016b) and funding has not been given to caretakers looking to be educated in MNRI due to its lack of evidence supporting its claims and proving it is cost-effective (Barrett

et al., 2016; Office of Administration Hearings, State of California, 2014). Every research article published contains Masgutova as an author (Akhmatova et al., 2015; Magutova et al., 2015; Masgutova et al., 2016; Masgutova, Akmatova, & Ludwika, 2016; Pilecka et al., 2012), constituting a level of professional bias and the American Academy of Pediatrics does not recommend MNRI as an evidence-based intervention (Barrett et al., 2016; Myers & Johnson, 2007). The Wisconsin Treatment Intervention Advisory Committee also reviewed MNRI and gave a Level 4 to the intervention, signifying there being a lack of proven clinical significance for MNRI (Wisconsin Department of Health Services, 2015). There is not one high quality study examining MNRI demonstrating favorable outcomes of the intervention while exhibiting experimental control, and further research is needed to prove the efficacy of MNRI with children with ASD (Barrett et al., 2016; Wisconsin Department of Health Services, 2015).

Reflex integration is an intervention that uses patterns of movement to manipulate neural connections throughout the body, and proposed these persisting primitive reflexes are connected with developmental disorders (Chinello et al., 2016; Zafieriou, 2004). The stated outcomes of addressing primitive reflexes include increased motor planning, communication, reading capabilities, physical stability, and more (Lang et al., 2010; Zafieriou, 2004; Zwaigenbaun et al., 2013). There has been no standard protocol for implementing reflex integration found, since the duration and frequency of implementing reflex integration varies by practitioner (Barrett et al., 2016). Of the published systematic reviews in peer-reviewed journals found analyzing the primitive reflexes of individuals with developmental disabilities (Blythe, 2005; Futagi & Suzuki, 2010; Hyatt et al., 2009; Ottenbacher, 1982; Teitelbaum, 2002; Zafieriou, 2004; Zwaigenbaun et al., 2013), none provide evidence for reflex integration therapy (Barrett et al., 2016). AOTA published three articles (Endler, 1978; Mailloux, et al., 2014; Ottenbacher, 1982) examining

primitive reflexes of individuals with developmental disabilities but results remain inconclusive for efficacy of reflex integration therapy and none focused on children with ASD (Barrett et al., 2016). Only one article found (Jordan-Black, 2005) focused on children with ASD and positive effects on the use of reflex integration, but it was not peer-reviewed (Barrett et al., 2016).

Proponents of reflex-integration conducted much of the research regarding this intervention, and reflex integration has either been not reviewed by expert review groups or has not been recommended as an evidence-based intervention for children with ASD (Barrett et al., 2016; Myers & Johnson, 2007). There is continuing controversy when discussing primitive reflexes and their impacts on development (Jordan-Black, 2005) and there is insufficient evidence supporting the use of reflex integration regarding the occupations and participation of children with ASD (Barrett et al., 2016).

Rhythmic Movement Training (RMT) is an intervention like reflex integration where RMT aids to integrate primitive infant reflexes as a series of movements so they are no longer active and inhibiting motor performance (Rhythmic Movement Training (RMT), 2014). RMT has been an intervention commonly used with children with ASD due to many children with ASD exhibiting motor planning difficulties (RMTi, 2016). There has been minimal research conducted to examine RMT and currently no scholarly research has been found investigating the effects of RMT, not only children with ASD, but the general population (Barrett et al., 2016). RMT has either been not reviewed by expert review groups or has not been recommended as an evidence-based intervention for children with ASD (Barrett et al., 2016; Myers & Johnson, 2007). Research is necessary to support the use of RMT as a therapeutic intervention addressing the occupations of children with ASD (Barrett et al., 2016).

Evidence-Base for Selected Sensory/Manipulative Therapies

The Wilbarger Protocol, Therasuit, and Craniosacral Therapy (CST) are three therapeutic interventions that focus on improving sensory defensiveness using touch (Bailes et al., 2011; Jakel & von Hauenschild, 2012; Lancaster et al., 2016). Though these three sensory/manipulative interventions claim to aid with the functioning of children, they have not been thoroughly examined for use with children with ASD and their occupational participation (Madison et al., 2016). All three interventions either have not been reviewed by expert review groups or they were investigated and not recommended as evidence-based practices (Madison et al., 2016; Myers & Johnson, 2007; Wisconsin Department of Health Services, 2014).

The Wilbarger Protocol was developed by Patricia Wilbarger in 1991 and consists of using a brush or deep pressure applied to the extremities to reduce tactile defensiveness or hypersensitivity to other stimuli (Kurtz, 2008; Lancaster et al., 2016; Wilbarger & Wilbarger, 2002). Though the proper implementation of the Wilbarger Protocol consists of three steps (deep pressure, joint compressions, and sensory diet), there are inconsistencies with how the Wilbarger Protocol is administered amongst practitioners (Lancaster et al., 2016). The Wilbarger Protocol is not intended as a “stand alone” intervention (Kurtz, 2008). A 2001 study examining the implementation of the Wilbarger Protocol revealed that occupational therapy practitioners were not concerned with the limited evidence evaluating the effectiveness of this intervention (Madison et al., 2016; Sudore, 2001). It is vital health practitioners adhere to the specific procedures to ensure treatment fidelity and to limit adverse effects from the therapeutic intervention (Breckenridge & Jones, 2015; Hildebrand et al., 2015; Lancaster et al., 2016). Many of the articles found (Weeks, Boshoff, & Stewardt, 2012; Wilbarger, 1995; Wilbarger 1998, Wilbarger & Wilbarger, 2002) did not focus on occupational performance or participation or

children with ASD; the primary focus was sensory defensiveness (Madison et al., 2016). Of the peer-reviewed articles found (Benson, Beeman, Smitsky, & Provident, 2011; Davis, Durand, & Chan, 2012; Kimball et al., 2007; Stagnitti, Raison, & Ryan, 1999; Weeks, Boshoff, & Stewardt, 2012), they contained poor external validity, such as very small sample sizes, differences in treatment administration, samples lacking homogeneity, differences in outcome measures, or professional biases (Madison et al., 2016). The Wilbarger Protocol has either been not reviewed by expert review groups or has not been recommended as an evidence-based intervention for children with ASD (Madison et al., 2016; Myers & Johnson, 2007). Further research is needed to provide support for the use of the Wilbarger Protocol in occupational therapeutic intervention for children with ASD (Madison et al., 2016).

The Therasuit is a suit worn to provide resistance on the muscles to improve posture, coordination, and strength (Bar-Haim, et al., 2006; Liptak, 2005; Martins et al., 2016). It was created by Richard and Izabela Koscielny in 2002 and was modeled from the Adeli Suit used by the Russian Space Program (Therasuit LLC, 2006). The Therasuit set includes a cap, shorts, kneepads, a vest, and shoe attachments (Lee, 2016; Martins et al., 2016). Due to there not being one peer-reviewed research article examining the Therasuit in any context, all research used to review the evidence were based on the Adeli Suit (Madison et al., 2016). The results of limited research (Alagesan et al., 2011; Bailes et al., 2011; Bar-Haim et al., 2006; Mahani, Karimloo, & Amirsalari, 2011; Martins et al., 2016) analyzing suit therapy suggest that suit therapy has small effects on functioning post-treatment (Madison et al., 2016). No peer-reviewed research was found examining the effects of the Adeli Suit (or Therasuit) on children with ASD and their occupational performance and participation (Madison et al., 2016). Each Therasuit set costs approximately \$2,500 and the Therasuit program itself costs the patients \$1,500 per week to

implement during therapy (Genius 4 Kids, 2011; Therasuit LLC, 2006). The Therasuit is an expensive intervention, and further research is needed to evaluate the effectiveness of this intervention on the occupations and participation of children with ASD before being considered as a treatment modality (Madison et al., 2016; Martins et al., 2016). The Therasuit has either been not reviewed by expert review groups or has not been recommended as an evidence-based intervention for children with ASD (Madison et al., 2016; Myers & Johnson, 2007).

Craniosacral Therapy (CST) was created by Upledger and proposes by applying gentle touch to release pressure around the spinal cord and the brain body functions can be restored (Ernst, 2012; Jakel & von Hauenschild, 2012; Upledger, 2000). The peer-reviewed research investigating the effects of CST are limited (Madison et al., 2016). There are no blinded, randomized controlled trials published studies and the only scientific support found for CST (Upledger, 1997) was conducted by the creator of CST and is flawed (Madison et al., 2016; Wisconsin Department of Health Services, 2016c). Wong and Smith (2006) reported when parents of children with ASD were asked what type of CAM treatments they used, 50% reported the use of massage therapy. Many of the claims purported by Upledger supplementing the use of CST are not supported by other professionals as being biologically implausible (Association for Science in Autism Treatment (ASAT), 2011; Hartman & Norton, 2002; Ferre, Chevalier, Lumineau, & Barbin, 1990). No peer-reviewed articles were found examining CST concerning the occupations and participation of children with ASD (Madison et al., 2016). Many articles (Ernst, 2012; Gasalberti, 2006; Hartman & Norman, 2002; Jakel & von Hauenschild, 2012) concluded further research is necessary before practitioners should include CST within their practice (Madison et al., 2016). Four expert review groups, the Wisconsin Intervention Advisory Committee, Academy of Pediatrics, Association for Science in Autism Treatment (ASAT), and

the National Guideline Clearinghouse all found CST lacking evidence supporting it as an evidence-based treatment (ASAT, 2011; Madison et al., 2016; Myers & Johnson, 2007; Wisconsin Department of Health Services, 2016c).

Appendix C

Ayers Sensory Integration and Sensory-Based Interventions

Interventions to addressing sensory processing issues utilized by occupational therapy practitioners (including the twelve specified interventions) are grouped into two categories: Ayers Sensory Integration® (ASI) and sensory-based interventions (SBIs) (Watling & Hauer, 2015). Due to ASI's emphasis on occupational performance, the practice approach of *sensory integration* used by occupational therapy practitioners is now trademarked as *Ayers Sensory Integration*® (Roley, Mailloux, Miller-Kuhaneck, & Glennon, 2007). Watling and Hauer (2015) defined ASI as “a play-based method that uses active engagement in sensory-rich activities to elicit the child's adaptive responses and improve the child's ability to successfully perform and meet environmental challenges” (p. 2). A vital component of ASI is the utilization of intervention activities based on an initial assessment of sensory processing issues experienced by the child to provide an individualized treatment (Watling & Hauer, 2015).

Though ASI and SBIs are often not distinguished in recent practice, there is a significant difference between ASI and SBIs and how they treat sensory problems (Watling & Hauer, 2015). The ASI approach aims to have long-term effects on internal neuropsychological processing of sensation to increase change in functional behavior and sensory responsiveness (Parham & Mailloux, 2015; Watling & Hauer, 2015). Sensory interventions utilizing the ASI approach have shown to be effective for treating sensory deficits and increasing the occupational participation of children with ASD (Parham & Mailloux, 2015; Watling & Hauer, 2015). This may be in part due to the play-based and thus occupation centered way in which ASI approaches intervention. On the other hand, SBIs often consist of applying a sensory modality to the child with the goal of producing a short-term effect on attention or behavior and are often not individualized to a

child's needs (Watling, Koenig, Davies, & Schaff, 2011). Research on common individual SBIs, such as weighted vests and the Wilbarger brushing protocol have found little to no effect on improving ASD symptoms, motor performance, cognitive functioning, and sensory integration (Watling & Hauer, 2015). In comparing ASI approaches to SBI approaches, one ASIs are occupation and activity based, whereas SBIs are seen as preparatory in nature and both include education and training of caregivers. For the purposes of this thesis, all twelve specified interventions are designated as SBI's due to them not relying on the tenets of ASI, especially that of the child initiating the therapeutic activity and addressing their activity participation (Watling & Hauer, 2015).

Appendix E

Survey Questionnaire

Evidence-Based Occupational Therapy Interventions in Minnesota Survey

Start of Block: Consent Information

Q1 You are invited to participate in a research study. This study is called Evidence-Based Occupational Therapy Interventions for Children with Autism: Current Practices and Continuing Education in Minnesota. The study is being done by Bryden Giving, a Master's student at St. Catherine University in St. Paul, MN. The faculty advisor for this study is Stephanie De Sam Lazaro, OTD, OTR/L and Julie Bass, Ph.D., OTR/L, FAOTA of the Department of Occupational Therapy at St. Catherine University. The purpose of this research is to examine the usage of twelve interventions used within pediatric occupational therapy within Minnesota. This study is important because your participation in this survey will contribute to a better understanding of how occupational therapy interventions for children with Autism are being provided within MN. Approximately 100 people are expected to participate in this research. Below, you will find answers to the most commonly asked questions about participating in a research study. Please read this entire page and ask questions you have before you agree to be in the study. It will approximately take 15 minutes to complete. Your responses to this survey will be anonymous and results will be presented in a way that no one will be identifiable. Confidentiality will be maintained to the degree permitted by Qualtrics, the password protected survey software used for this research. Specifically, no guarantees can be made regarding the interception of data sent via the internet by any third parties. Your participation is voluntary and your decision whether or not to participate will not affect your relationships with the researchers and Saint Catherine University. If you decide to stop at any time you may do so. You may also skip any item that you do not want to answer. If you have any questions about this project, please contact Bryden or Dr. de Sam Lazaro at bgiving@stkate.edu or sldesamlazaro@stkate.edu, respectively. If you have further questions, you can contact the Institutional Reviewer Board Chair of Saint Catherine University, John Schmitt, PT, Ph.D., 651.690.7739; jsschmitt@stkate.edu. By clicking the advance arrow below and responding to items on this survey, you are giving us your consent to allow us to use your responses for research and educational purposes.

Page Break

End of Block: Consent Information

Start of Block: Introduction/Demographic Questions

Q2 How many years have you been practicing in the occupational therapy field?

- 0 - 5 years
 - 5 - 10 years
 - 10 - 15 years
 - 15 - 20 years
 - 20 - 25 years
 - 25 + years
-

Q3 How many years have you been practicing in pediatrics specifically?

- 0 - 5 years
 - 5 - 10 years
 - 10 - 15 years
 - 15 - 20 years
 - 20 - 25 years
 - 25 + years
-

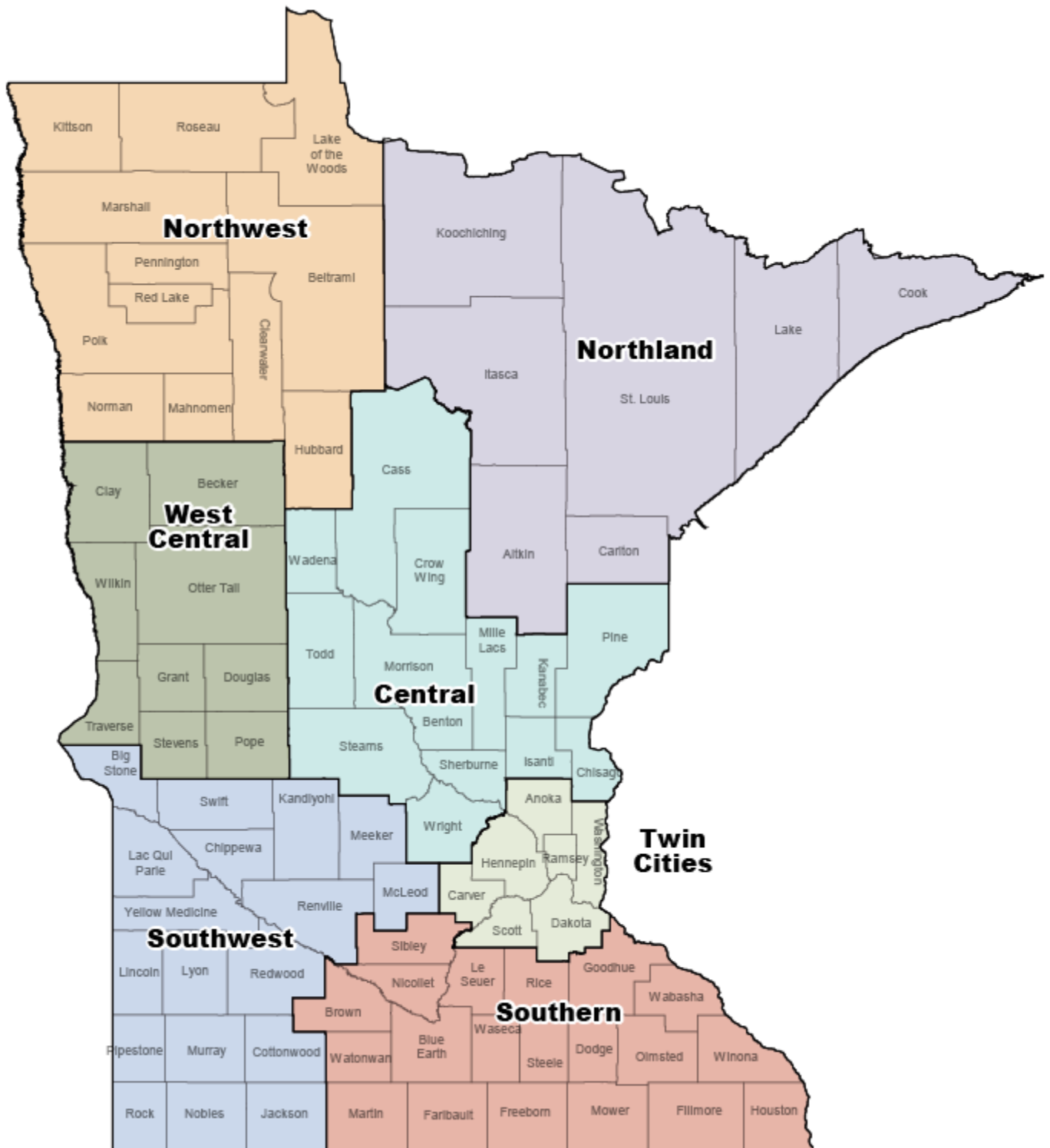
Q4 What is your highest level of occupational therapy education?

- Associate's Degree
 - Bachelor's Degree
 - Master's Degree
 - Doctoral Degree
-

Q5 What is your current position in occupational therapy practice?

- Occupational Therapy Assistant
 - Occupational Therapist
-

Q6



Q7 Looking at the graphic above, where in Minnesota do you currently practice?

- Southern MN
 - Southwest MN
 - Twin Cities
 - Central MN
 - West Central MN
 - Northland MN
 - Northwest MN
-

Q8 Please select your primary place of practice when working with children with ASD out of the five settings

- Inpatient
 - Outpatient
 - School-based
 - Home-care
 - Private practice
 - Other _____
-

Q9 What percentage of your time do you work with children with ASD?

- Less than 15%
- 15% - 30%
- 30% - 45%
- 45% - 60%
- 60% - 75%
- Greater than 75%

Q10 Which of these interventions have you heard of/used before?

- Auditory Integration Training
 - Therapeutic Listening
 - The Listening Program
 - Brain Gym
 - Interactive Metronome
 - Makoto Therapy
 - Masgutova Method (MNRI)
 - Reflex Integration
 - Rhythmic Movement Training
 - Wilbarger Protocol
 - Therasuit
 - Craniosacral Therapy
 - Unsure, as I am not familiar with the following list of above interventions
-

Q11 Have you heard of Comprehensive Treatment Models?

Yes

No



Page Break



Q12 A Comprehensive Treatment Model consists of "a set of practices designed to achieve a broad learning or developmental impact on the core deficits of ASD" and "are characterized by

1. organization (ex. around a conceptual framework),
 2. operationalization (ex. procedures manualized),
 3. intensity (ex. substantial number of hours per week),
 4. longevity (ex. occur across one or more years), and
 5. breadth of outcome focus (ex. multiple outcomes such as communication, behavior, social competence targeted)" (Wong et al., 2013, p. 3)
-

Q13 Using the definition above, which of these interventions would you consider being Comprehensive Treatment Models? (Check all that apply)

- Auditory Integration Training (1)
 - Therapeutic Listening (2)
 - The Listening Program (3)
 - Brain Gym (4)
 - Interactive Metronome (5)
 - Makoto Therapy (6)
 - Masgutova Method (MNRI) (7)
 - Reflex Integration (8)
 - Rhythmic Movement Training (9)
 - Wilbarger (10)
 - Therasuit (11)
 - Craniosacral Therapy (12)
 - Unsure, as I am not familiar with the following list of above interventions (13)
-

Page Break

End of Block: Introduction/Demographic Questions

Start of Block: Auditory Integration Training**Q14 Auditory Integration Training**

Q15 Are you trained/certified to implement this intervention in practice?

- Yes (1)
- No (2)
-

Display This Question:

If Q15 = Yes

Q16 What led you to pursue training in this intervention method?

- A caregiver of a client mentioned it (1)
- A colleague was trained in it (2)
- My site requires/endorse training in this intervention method (3)
- I read about it in a journal or other scholarly work (4)
- I heard about it through mailing to my home or workplace (5)
- I saw it on the AOTA approved provider list (6)
- Social media groups (7)
- Other (8) _____
-

Q17 To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?

- Yes (1)
- No (2)
- Unsure (3)
-

Q18 Have you used this intervention while working with a child with ASD?

- Yes (1)
- No (3)
-

Display This Question:

If Q18 = Yes

Q19 _____ of my intervention time with clients with an ASD diagnosis is spent using this intervention.

- Less than 25% (1)
- 25% - 50% (2)
- 50% - 75% (3)
- More than 75% (4)
-

Q20 Have you seen other occupational therapists use this intervention while working with a child with ASD?

- Yes (1)
- No (2)
-

End of Block: Auditory Integration Training

Start of Block: Therapeutic Listening**Q21 Therapeutic Listening**

Q22 Are you trained/certified to implement this intervention in practice?

- Yes (1)
- No (2)
-

Display This Question:

If Q22 = Yes

Q23 What led you to pursue training in this intervention method?

- A caregiver of a client mentioned it (1)
- A colleague was trained in it (2)
- My site requires/endorsees training in this intervention method (3)
- I read about it in a journal or other scholarly work (4)
- I heard about it through mailing to my home or workplace (5)
- I saw it on the AOTA approved provider list (6)
- Social media groups (7)
- Other (8) _____
-

Q24 To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?

- Yes (1)
- No (2)
- Unsure (3)
-

Q25 Have you used this intervention while working with a child with ASD?

- Yes (1)
- No (3)
-

Display This Question:

If Q25 = Yes

Q26 _____ of my intervention time with clients with an ASD diagnosis is spent using this intervention.

- Less than 25% (1)
- 25% - 50% (2)
- 50% - 75% (3)
- More than 75% (4)
-

Q27 Have you seen other occupational therapists use this intervention while working with a child with ASD?

- Yes (1)
- No (2)
-

End of Block: Therapeutic Listening

Start of Block: The Listening Program**Q28 The Listening Program**

Q29 Are you trained/certified to implement this intervention in practice?

- Yes (1)
- No (2)
-

Display This Question:

If Q29 = Yes

Q30 What led you to pursue training in this intervention method?

- A caregiver of a client mentioned it (1)
- A colleague was trained in it (2)
- My site requires/endorse training in this intervention method (3)
- I read about it in a journal or other scholarly work (4)
- I heard about it through mailing to my home or workplace (5)
- I saw it on the AOTA approved provider list (6)
- Social media groups (7)
- Other (8) _____
-

Q31 To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?

- Yes (1)
- No (2)
- Unsure (3)
-

Q32 Have you used this intervention while working with a child with ASD?

- Yes (1)
- No (3)
-

Display This Question:

If Q32 = Yes

Q33 _____ of my intervention time with clients with an ASD diagnosis is spent using this intervention.

- Less than 25% (1)
- 25% - 50% (2)
- 50% - 75% (3)
- More than 75% (4)
-

Q34 Have you seen other occupational therapists use this intervention while working with a child with ASD?

- Yes (1)
- No (2)
-

End of Block: The Listening Program

Start of Block: Brain Gym**Q35 Brain Gym**

Q36 Are you trained/certified to implement this intervention in practice?

- Yes (1)
- No (2)
-

Display This Question:

If Q36 = Yes

Q37 What led you to pursue training in this intervention method?

- A caregiver of a client mentioned it (1)
- A colleague was trained in it (2)
- My site requires/endorsees training in this intervention method (3)
- I read about it in a journal or other scholarly work (4)
- I heard about it through mailing to my home or workplace (5)
- I saw it on the AOTA approved provider list (6)
- Social media groups (7)
- Other (8) _____
-

Q38 To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?

- Yes (1)
- No (2)
- Unsure (3)
-

Q39 Have you used this intervention while working with a child with ASD?

- Yes (1)
- No (3)
-

Display This Question:

If Q39 = Yes

Q40 _____ of my intervention time with clients with an ASD diagnosis is spent using this intervention.

- Less than 25% (1)
- 25% - 50% (2)
- 50% - 75% (3)
- More than 75% (4)
-

Q41 Have you seen other occupational therapists use this intervention while working with a child with ASD?

- Yes (1)
- No (2)
-

End of Block: Brain Gym

Start of Block: Interactive Metronome**Q42 Interactive Metronome**

Q43 Are you trained/certified to implement this intervention in practice?

- Yes (1)
- No (2)
-

Display This Question:

If Q43 = Yes

Q44 What led you to pursue training in this intervention method?

- A caregiver of a client mentioned it (1)
- A colleague was trained in it (2)
- My site requires/endorsees training in this intervention method (3)
- I read about it in a journal or other scholarly work (4)
- I heard about it through mailing to my home or workplace (5)
- I saw it on the AOTA approved provider list (6)
- Social media groups (7)
- Other (8) _____
-

Q45 To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?

- Yes (1)
- No (2)
- Unsure (3)
-

Q46 Have you used this intervention while working with a child with ASD?

- Yes (1)
- No (3)
-

Display This Question:

If Q46 = Yes

Q47 _____ of my intervention time with clients with an ASD diagnosis is spent using this intervention.

- Less than 25% (1)
- 25% - 50% (2)
- 50% - 75% (3)
- More than 75% (4)
-

Q48 Have you seen other occupational therapists use this intervention while working with a child with ASD?

- Yes (1)
- No (2)
-

End of Block: Interactive Metronome

Start of Block: Makoto Therapy**Q49 Makoto Therapy**

Q50 Are you trained/certified to implement this intervention in practice?

- Yes (1)
- No (2)
-

Display This Question:

If Q50 = Yes

Q51 What led you to pursue training in this intervention method?

- A caregiver of a client mentioned it (1)
- A colleague was trained in it (2)
- My site requires/endorsees training in this intervention method (3)
- I read about it in a journal or other scholarly work (4)
- I heard about it through mailing to my home or workplace (5)
- I saw it on the AOTA approved provider list (6)
- Social media groups (7)
- Other (8) _____
-

Q52 To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?

- Yes (1)
- No (2)
- Unsure (3)
-

Q53 Have you used this intervention while working with a child with ASD?

- Yes (1)
- No (3)
-

Display This Question:

If Q53 = Yes

Q54 _____ of my intervention time with clients with an ASD diagnosis is spent using this intervention.

- Less than 25% (1)
- 25% - 50% (2)
- 50% - 75% (3)
- More than 75% (4)
-

Q55 Have you seen other occupational therapists use this intervention while working with a child with ASD?

- Yes (1)
- No (2)
-

End of Block: Makoto Therapy

Start of Block: Masgutova Method (MNRI)**Q56 Masgutova Method (MNRI)**

Q57 Are you trained/certified to implement this intervention in practice?

- Yes (1)
- No (2)
-

Display This Question:

If Q57 = Yes

Q58 What led you to pursue training in this intervention method?

- A caregiver of a client mentioned it (1)
- A colleague was trained in it (2)
- My site requires/endorsees training in this intervention method (3)
- I read about it in a journal or other scholarly work (4)
- I heard about it through mailing to my home or workplace (5)
- I saw it on the AOTA approved provider list (6)
- Social media groups (7)
- Other (8) _____
-

Q59 To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?

- Yes (1)
- No (2)
- Unsure (3)
-

Q60 Have you used this intervention while working with a child with ASD?

- Yes (1)
- No (3)
-

Display This Question:

If Q60 = Yes

Q61 _____ of my intervention time with clients with an ASD diagnosis is spent using this intervention.

- Less than 25% (1)
- 25% - 50% (2)
- 50% - 75% (3)
- More than 75% (4)
-

Q62 Have you seen other occupational therapists use this intervention while working with a child with ASD?

- Yes (1)
- No (2)
-

End of Block: Masgutova Method (MNRI)

Start of Block: Reflex Integration**Q63 Reflex Integration**

Q64 Are you trained/certified to implement this intervention in practice?

- Yes (1)
- No (2)
-

Display This Question:

If Q64 = Yes

Q65 What led you to pursue training in this intervention method?

- A caregiver of a client mentioned it (1)
- A colleague was trained in it (2)
- My site requires/endorsees training in this intervention method (3)
- I read about it in a journal or other scholarly work (4)
- I heard about it through mailing to my home or workplace (5)
- I saw it on the AOTA approved provider list (6)
- Social media groups (7)
- Other (8) _____
-

Q66 To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?

- Yes (1)
- No (2)
- Unsure (3)
-

Q67 Have you used this intervention while working with a child with ASD?

- Yes (1)
- No (3)
-

Display This Question:

If Q67 = Yes

Q68 _____ of my intervention time with clients with an ASD diagnosis is spent using this intervention.

- Less than 25% (1)
- 25% - 50% (2)
- 50% - 75% (3)
- More than 75% (4)
-

Q69 Have you seen other occupational therapists use this intervention while working with a child with ASD?

- Yes (1)
- No (2)
-

End of Block: Reflex Integration

Start of Block: Rhythmic Movement Training**Q70 Rhythmic Movement Training**

Q71 Are you trained/certified to implement this intervention in practice?

- Yes (1)
- No (2)
-

Display This Question:

If Q71 = Yes

Q72 What led you to pursue training in this intervention method?

- A caregiver of a client mentioned it (1)
- A colleague was trained in it (2)
- My site requires/endorsees training in this intervention method (3)
- I read about it in a journal or other scholarly work (4)
- I heard about it through mailing to my home or workplace (5)
- I saw it on the AOTA approved provider list (6)
- Social media groups (7)
- Other (8) _____
-

Q73 To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?

- Yes (1)
- No (2)
- Unsure (3)
-

Q74 Have you used this intervention while working with a child with ASD?

- Yes (1)
- No (3)
-

Display This Question:

If Q74 = Yes

Q75 _____ of my intervention time with clients with an ASD diagnosis is spent using this intervention.

- Less than 25% (1)
- 25% - 50% (2)
- 50% - 75% (3)
- More than 75% (4)
-

Q76 Have you seen other occupational therapists use this intervention while working with a child with ASD?

- Yes (1)
- No (2)
-

End of Block: Rhythmic Movement Training

Start of Block: Wilbarger Protocol**Q77 Wilbarger Protocol**

Q78 Are you trained/certified to implement this intervention in practice?

- Yes (1)
- No (2)
-

Display This Question:

If Q78 = Yes

Q79 What led you to pursue training in this intervention method?

- A caregiver of a client mentioned it (1)
- A colleague was trained in it (2)
- My site requires/endorsees training in this intervention method (3)
- I read about it in a journal or other scholarly work (4)
- I heard about it through mailing to my home or workplace (5)
- I saw it on the AOTA approved provider list (6)
- Social media groups (7)
- Other (8) _____
-

Q80 To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?

- Yes (1)
- No (2)
- Unsure (3)
-

Q81 Have you used this intervention while working with a child with ASD?

- Yes (1)
- No (3)
-

Display This Question:

If Q81 = Yes

Q82 _____ of my intervention time with clients with an ASD diagnosis is spent using this intervention.

- Less than 25% (1)
- 25% - 50% (2)
- 50% - 75% (3)
- More than 75% (4)
-

Q83 Have you seen other occupational therapists use this intervention while working with a child with ASD?

- Yes (1)
- No (2)
-

End of Block: Wilbarger Protocol

Start of Block: Therasuit**Q84 Therasuit**

Q85 Are you trained/certified to implement this intervention in practice?

- Yes (1)
- No (2)
-

Display This Question:

If Q85 = Yes

Q86 What led you to pursue training in this intervention method?

- A caregiver of a client mentioned it (1)
- A colleague was trained in it (2)
- My site requires/endorsees training in this intervention method (3)
- I read about it in a journal or other scholarly work (4)
- I heard about it through mailing to my home or workplace (5)
- I saw it on the AOTA approved provider list (6)
- Social media groups (7)
- Other (8) _____
-

Q87 To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?

- Yes (1)
- No (2)
- Unsure (3)
-

Q88 Have you used this intervention while working with a child with ASD?

- Yes (1)
- No (3)
-

Display This Question:

If Q88 = Yes

Q89 _____ of my intervention time with clients with an ASD diagnosis is spent using this intervention.

- Less than 25% (1)
- 25% - 50% (2)
- 50% - 75% (3)
- More than 75% (4)
-

Q90 Have you seen other occupational therapists use this intervention while working with a child with ASD?

- Yes (1)
- No (2)
-

Page Break

End of Block: Therasuit

Start of Block: Craniosacral Therapy**Q91 Craniosacral Therapy**

Q92 Are you trained/certified to implement this intervention in practice?

- Yes (1)
- No (2)
-

Display This Question:

If Q92 = Yes

Q93 What led you to pursue training in this intervention method?

- A caregiver of a client mentioned it (1)
- A colleague was trained in it (2)
- My site requires/endorse training in this intervention method (3)
- I read about it in a journal or other scholarly work (4)
- I heard about it through mailing to my home or workplace (5)
- I saw it on the AOTA approved provider list (6)
- Social media groups (7)
- Other (8) _____
-

Q94 To your knowledge, do you believe you are using this intervention as a Comprehensive Treatment Model (CTM)?

- Yes (1)
- No (2)
- Unsure (3)
-

Q95 Have you used this intervention while working with a child with ASD?

- Yes (1)
- No (3)
-

Display This Question:

If Q95 = Yes

Q96 _____ of my intervention time with clients with an ASD diagnosis is spent using this intervention.

- Less than 25% (1)
- 25% - 50% (2)
- 50% - 75% (3)
- More than 75% (4)
-

Q97 Have you seen other occupational therapists use this intervention while working with a child with ASD?

- Yes (1)
- No (2)
-

End of Block: Craniosacral Therapy

Start of Block: Conclusion

Q98 Would you be willing to participate in future research?

Yes (1)

No (2)

Display This Question:

If Q98 = Yes

Q99 Please provide your email so we can contact you.

Email: (1) _____

Q100 Reference: Wong, C., Odom, S. L., Hume, K. Cox, A. W., Fettig, A., Kucharczyk, S., ... Schultz, T. R. (2014). *Evidence-based practices for children, youth, and young adults with Autism Spectrum Disorder*. Chapel Hill: The University of North Carolina, Frank Porter Graham Child Development Institute, Autism Evidence-Based Practice Review Group

End of Block: Conclusion

Appendix F

Consent Form for Completion of Survey

ST CATHERINE UNIVERSITY

Informed Consent for a Research Study

Study Title: Pediatric Interventions Within Pediatric Occupational Therapy in Minnesota

Researcher(s): Bryden Giving, OTS, Stephanie De Sam Lazaro, OTD, OTR/L and Julie Bass, PhD, OTR/L, FAOTA

You are invited to participate in a research study. This study is called Evidence-Based Occupational Therapy Interventions for Children with Autism: Current Practices and Continuing Education in Minnesota. The study is being done by Bryden Giving, a Master's student at St. Catherine University in St. Paul, MN. The faculty advisor for this study is Stephanie De Sam Lazaro, OTD, OTR/L and Julie Bass, PhD, OTR/L, FAOTA of the Department of Occupational Therapy at St. Catherine University.

The purpose of this research is to examine the usage of twelve interventions used within pediatric occupational therapy within Minnesota. This study is important because your participation in this survey will contribute to a better understanding of how occupational therapy interventions for children with Autism are being provided within MN. Below, you will find answers to the most commonly asked questions about participating in a research study. Please read this entire document and ask questions you have before you agree to be in the study. It will approximately take 15 minutes to complete.

Your responses to this survey will be anonymous and results will be presented in a way that no one will be identifiable. Confidentiality will be maintained to the degree permitted by Qualtrics, the password protected survey software used for this research. Specifically, no guarantees can be made regarding the interception of data sent via the internet by any third parties.

Your participation is voluntary and your decision whether or not to participate will not affect your relationships with the researchers and Saint Catherine University. If you decide to stop at any time you may do so. You may also skip any item that you do not want to answer. If you have any questions about this project, please contact Bryden or Dr. de Sam Lazaro at bgiving@stkate.edu or sldesamlazaro@stkate.edu, respectively. If you have further questions, you can contact the Institutional Reviewer Board Chair of Saint Catherine University, John Schmitt, PT, PhD, 651.690.7739; jsschmitt@stkate.edu. By clicking the advance arrow below and responding to items on this survey, you are giving us your consent to allow us to use your responses for research and educational purposes.

Appendix G

IRB Approval for Survey

To: Bryden Giving
From: John Schmitt, IRB Chair
Subject: Protocol #922
Date: 10/01/2017

Thank you for submitting your research proposal to the St. Catherine University Institutional Review Board (IRB). The primary purpose of the IRB is to safeguard and respect the rights and welfare of human subjects in scientific research. In addition, IRB review serves to promote quality research and to protect the researcher, the advisor, and the university. By submitting an IRB application to the IRB Committee you are agreeing to adhere to the St. Catherine University Research Involving Human Subjects Policy.

On behalf of the IRB, I am responding to your request for Exempt level approval to use human subjects in your research. The application # **922: Evidence-Based Occupational Therapy Interventions for Children with Autism: Current Practices and Continuing Education in Minnesota** has been verified by the St. Catherine University Institutional Review Board as Exempt according to 45CFR46.101(b)(2): Anonymous Surveys - No Risk on 10/01/2017. The project was approved as submitted. You may begin your research at any time.

Please note that changes to your protocol may affect its exempt status. You must request approval for any changes that will affect the risk to your subjects using the Amendment Request Form. You should not initiate these changes until you receive written IRB approval. Also, you should report any adverse events to the IRB using the Adverse Event Form. These documents are available at the Mentor IRB system homepage, which can be accessed through the St. Catherine University IRB homepage. When the project is complete, please submit a project completion form.

If you have any questions, feel free to contact me or email via the Mentor messaging system. We appreciate your attention to the appropriate treatment of research subjects. Thank you for working cooperatively with the IRB; best wishes in your research!

Sincerely,

John Schmitt, PhD

Chair, Institutional Review Board

jsschmitt@stkate.edu

Appendix H

Script and Questions for Focus Groups

“Welcome and thank you for your willingness to participate in this focus group. As was mentioned in the consent form, we are hoping to gain more information on how evidence-based practices and comprehensive treatment models are currently being used in pediatric occupational therapy in Minnesota. We are also hoping to gain more information on how a specific list of interventions which include Therapeutic Listening, the Listening Program, Auditory Integration Therapy, MNRI, Reflex Integration, Brain Gym, Interactive Metronome, Makoto Therapy, Rhythmic Movement Training, Wilbarger Protocol, Therasuit, and Craniosacral Therapy, are being used with children who are diagnosed as on the autism spectrum in MN.

- 1) Evidence-based practice is a term used widely in OT and inter-professional circles at this time.
 - a) In your own words, what does it mean to be an evidence-based practitioner?
 - b) Can you provide examples of ways in which your work setting encourages practitioner’s awareness and understanding of current evidence-based practices and/or the development of skills in providing evidence-based practice?
- 2) In our survey, we asked questions about whether or not practitioners were trained in each of the 12 interventions that our study is examining. As a reminder these include Therapeutic Listening, the Listening Program, Auditory Integration Therapy, MNRI, Reflex Integration, Brain Gym, Interactive Metronome, Makoto Therapy, Rhythmic Movement Training, Wilbarger Protocol, Therasuit, and Craniosacral Therapy. Think about which of these you are trained to provide. Think about the five types of OT intervention as outlined in the OT

Practice Framework: Occupations and Activities, Preparatory methods, Education and training, Advocacy, and Group Intervention.

- a) Can you describe which types of OT intervention (from the list of five) are utilized when providing each of the interventions (from the list of twelve) in which you are trained?
 - b) Can you pick and name one of the twelve interventions in which you are trained and describe how an intervention session would look for a child on the autism spectrum using that intervention?
 - c) After you use one of these interventions with a child with ASD, how are you documenting and billing for those services? Have you encountered any reimbursement problems from billing these interventions or noted particular insurances that cover them while others do not?
 - d) Based on the survey results, for many of the interventions, the primary methods of hearing about these interventions was the intervention being required or endorsed by your site or that a colleague was trained in the intervention. We would like to gain a little more understanding of these themes and are wondering if you can provide examples about how and why you pursued training on any of these twelve interventions?
- 3) Some of you may be aware, while others may not, that my cohort of peers conducted an evidence-based review on all twelve of these interventions and found all of them to be of an experimental level and some to even be potentially harmful for children with ASD and developmental disabilities. We did not determine any of them to be evidence-based practices.
- a) What are your reactions to this information?
 - b) How comfortable do you feel talking to your colleagues or managers about evidence-based practice and the lack of evidence supporting these interventions?

c) What do you think the next big steps in pediatric OT should be for children with ASD?

Where should our profession go for children with ASD and more specifically in MN?

d) What would best help you as therapists to stay up to date on evidence-based practices for children with ASD? What kind of continuing education would work best? Any concluding thoughts on this topic?"

Appendix I

Level I and Level II Coding for Focus Group Transcription

The Level II codes are the general themes found throughout the focus group transcription. Within each Level II code, Level I codes were created to identify subsections within the Level II codes.

Level II Codes

- **Theme 1** – Knowledge and Use of Evidence-Based Practice
 - 1.1: Definition/knowledge of evidence-based practice
 - 1.2: How the work setting encourages practitioners' awareness of evidence-based practice
 - 1.3: Reactions to hearing interventions are not evidence-based
 - 1.4: Why they still use an intervention knowing it was not evidence-based; justification
 - 1.5: If practitioners are comfortable/would discuss evidence-based practices at their workplace
 - 1.6: Talking with parents about evidence-based practices
 - 1.7: Influenced by intervention creators regarding treatment or continuing education
 - 1.8: Expectations by workplace
 - 1.9: Barriers to being EBP
- **Theme 2** – Training and Certification in Interventions
 - 2.1: Training/knowledge concerning a listening therapy
 - 2.2: Training/knowledge concerning a movement therapy
 - 2.3: Training/knowledge concerning a reflex integration therapy
 - 2.4: Training/knowledge concerning a sensory/manipulative therapy
 - 2.5: General knowledge/prevalence of interventions
 - 2.6: How/why clinicians were trained in an intervention
- **Theme 3** – How the Twelve Interventions Are Used in Practice
 - 3.1: Use of intervention in terms of OTPF
 - 3.2: How an intervention is implemented/used in practice
 - 3.3: Why they selected/justification for utilizing an intervention for treatment
 - 3.4: How they have seen other therapists use an intervention in practice
 - 3.5: Using an intervention without formal training
 - 3.6: Billing and reimbursement of services
 - 3.7: Similarities/differences between school-based and clinic-based
- **Theme 4** – Continuing Education Needs and Resources
 - 4.1: Lack of access to current research/resources
 - 4.2: Current resources
 - 4.3: More access to OT journals/information
 - 4.4: Better access to OT/EBP interventions
 - 4.5: Current difficulties in pediatric occupational therapy practice

- 4.6: Relying on MOTA, graduate institutions or leadership needs
- 4.7: Benefits to working with a newer graduate
- 4.8: Better access/barriers to continuing education opportunities or interventions
- 4.9: Benefits of pursuing continuing education opportunities and evidence-based practices
- 4.10: Ideas for continuing education resources or access to evidence-based interventions
- 4.11: Better understanding of EBP or knowing where the research is coming from
- 4.12: Need for more research
- **Theme 5** – Future Direction for Pediatric OT
 - 5.1: Views on current and future pediatric occupational therapy practice
 - 5.2: Pediatric occupational therapy need areas

Appendix J

Focus Group Consent Form

ST CATHERINE UNIVERSITY

Informed Consent for a Research Study

Study Title: Pediatric Interventions Within Pediatric Occupational Therapy in Minnesota

Researcher(s): Bryden Giving, OTS, and Stephanie de Sam Lazaro, OTD, OTR/L

You are invited to participate in a research study. This study is called Evidence-Based Occupational Therapy Interventions for Children with Autism: Current Practices and Continuing Education in Minnesota. The study is being done by Bryden Giving, a Master's student at St. Catherine University in St. Paul, MN. The faculty advisor for this study is Stephanie de Sam Lazaro, OTD, OTR/L of the Department of Occupational Therapy at St. Catherine University. The purpose of this research is to examine the usage of twelve interventions used within pediatric occupational therapy within Minnesota. This study is important because your participation within these focus groups will contribute to bettering occupational therapy practices for children with Autism. Approximately 20 people are expected to participate within these focus groups. Below, you will find answers to the most commonly asked questions about participating in a research study. Please read this entire document and ask questions you have before you agree to be in the study.

Why have I been asked to be in this study?

You provided your email address in response to "Would you be willing to participate in future research?" on a survey related to Evidence-Based OT Interventions in MN.

If I decide to participate, what will I be asked to do?

You will be asked to do the following:

1. This research entails the participation within a focus group. You have the option to not participate when asked a question.
2. The questions asked will pertain to results from the survey you have recently taken for this research study.

In total, this study will take approximately 2 hours over 1 session.

What if I decide I don't want to be in this study?

Participation in this study is completely voluntary. If you decide you do not want to participate in this study, please feel free to say so, and do not sign this form. If you decide to participate in this study, but later change your mind and want to withdraw, simply notify Bryden and you will be removed immediately. You have the option to withdraw from the study and not have the researchers utilize your data up to one week after participating within a focus group. Your

decision of whether to participate will have no negative or positive impact on your relationship with St. Catherine University, nor with any of the students or faculty involved in the research.

What are the risks (dangers or harms) to me if I am in this study?

There is potential risk that individuals may not feel comfortable answering questions during their session due to the controversial nature of some of the topics that will be discussed.

What are the benefits (good things) that may happen if I am in this study?

There are no direct benefits to you for participating in this research, but your participation within the focus groups will contribute to bettering pediatric occupational therapy practice in MN.

Will I receive any compensation for participating in this study?

You will not be compensated for participating in this study, however light refreshments will be provided prior to the start of the focus group.

What will you do with the information you get from me and how will you protect my privacy?

The information that you provide in this study will be saved as audio due to the focus group sessions being recorded for a detailed analysis. It's important for subjects to know that data from focus groups cannot be considered anonymous due to keeping audiotape data. To keep a high degree of confidentiality, your name and email will not be saved among the audio recordings. We will keep the research results indefinitely, and it will be held within a data storage system. Only Bryden, Dr. de Sam Lazaro, and Dr. Bass will have access to the data. Any information that you provide will be kept confidential, which means that you will not be identified or identifiable in the any written reports or publications. If it becomes useful to disclose any of your information, we will seek your permission and tell you the persons or agencies to whom the information will be furnished, the nature of the information to be furnished, and the purpose of the disclosure; you will have the right to grant or deny permission for this to happen. If you do not grant permission, the information will remain confidential and will not be released.

Are there possible changes to the study once it gets started?

If during the course of this research study we learn about new findings that might influence your willingness to continue participating in the study, we will inform you of these findings

How can I get more information?

If you have any questions, you can ask them before you sign this form. You can also feel free to contact Bryden or Dr. de Sam Lazaro at bgiving@stkate.edu or sldesamlazaro@stkate.edu, respectively.

If you have any additional questions later and would like to talk to the faculty advisor, please contact Dr. de Sam Lazaro at sldesamlazaro@stkate.edu. If you have other questions or concerns regarding the study and would like to talk to someone other than the researcher(s), you

may also contact Dr. John Schmitt, Chair of the St. Catherine University Institutional Review Board, at (651) 690-7739 or jsschmitt@stkate.edu.

You may keep a copy of this form for your records.

Statement of Consent:

I consent to participate in the study and agree to be audiotaped.

My signature indicates that I have read this information and my questions have been answered. I also know that even after signing this form, I may withdraw from the study by informing the researcher(s).

Signature of Participant

Date

Signature of Researcher

Date

Appendix K

IRB Amendment Approval for Focus Groups

St. Catherine University IRB Amendment Approval Notification

To: Bryden Giving
From: John Schmitt, IRB Chair
Subject: Protocol #922
Date: 01/08/2018

“The revised amendment to protocol Evidence-Based Occupational Therapy Interventions for Children with Autism: Current Practices and Continuing Education in Minnesota has been approved by the IRB Chair on 01/08/2018.
If you have any questions, feel free to contact me.”

John Schmitt, IRB Chair jsschmitt@stkate.edu

Appendix L

Evidence-Based Occupational Therapy Interventions for Children with Autism: Current Practices and Continuing Education in Minnesota



Bryden Giving, OTS, Stephanie De Sam Lazaro, OTD, OTR/L & Julie Bass, PhD, OTR/L, FAOTA

Background Information

- Sensory integration is the most sought after and favored approach in occupational therapy practice for children with Autism Spectrum Disorder (ASD) (Green et al., 2006; Kadar, McDonald, & Lentini, 2012; Mandell, Novak, Zubricky, & Levy, 2005; Watling & Hauer, 2015)
- There is a growing need for evidence-based practice and occupation-centered practice for children with ASD (Auburner et al., 2014; Lamb & Metzler, 2014; Polatajko & Gartin, 2010)
- One of the primary methods of providing occupational therapy interventions for children with ASD is through a Comprehensive Treatment Model (CTM) (Odum, Boyd, Hall, & Hume, 2010; Wong et al., 2014).
- The dire need for more research concerning sensory-based interventions for children with ASD has contributed to the increasing use of complementary and alternative medicine (CAM) within pediatric occupational therapy (Abbey, 2009; Auburnner et al., 2014).
- Concerns have been raised regarding the strength of evidence supporting twelve widely-used sensory-based interventions and their effectiveness addressing the occupations of children with ASD (Myers & Johnson, 2007; Wisconsin Department of Health Services, 2016).
- Due to the questioning of these twelve interventions, an analysis of the evidence was conducted

Adapted from PEP9 Model, Baum, C., Christiansen, C., & Bass, J. (2015). Person-Environment-Occupational Performance (PEOP) Model. In C. Christiansen, C. Baum, J. Bass, Occupational Therapy: Performance, Participation, Well-being (4th ed.). Thorofare, NJ: Slack.



The Evidence-Based Practice Process

- The EBP Process** (Lin et al., 2010; Mayer, 2010; Straus et al., 2009)
- Pose an answerable research question
 - Searching and collecting current published evidence that addresses your research question
 - Appraising the gathered evidence to determine which evidence is “the best” to answer your question (evaluating type of evidence, research design, investigator qualifications, where is it published, etc.)
 - Critically reviewing the best evidence, such as systematic reviews, examining for consistent/inconsistent findings, etc.
 - Recommendations for practice

Wisconsin Determination Levels (Wisconsin Department of Health Services, 2014; Wisconsin Department of Health Services, 2016)

The Wisconsin Intervention Advisory Committee is an expert review group that analyzes the quality of evidence concerning interventions for children with ASD to ensure they are receiving quality care. The established determination levels are:

- Level 1 – Well Established or Strong Evidence (Effective and Proven Treatment)**
- Level 2 – Established or Moderate Evidence (Effective and Proven Treatment)**
- Level 3 – Emerging Evidence (Promising as an Effective Treatment)**
- Level 4 – Insufficient Evidence (Experimental Treatment)**
- Level 5 – Untested (Experimental Treatment) and/or Potentially Harmful.**

Results

The recommendations made by the Evidence-Based Practice course at St. Catherine University based on the Wisconsin Determination Levels

Intervention	Determination Level	Intervention	Determination Level
Auditory Integration Therapy	5 ^{ab}	Masgutova Method (MNRI)	4 ^{ab}
The Listening Program	5 ^b	Reflex Integration	4 ^b
Therapeutic Listening	5 ^{ab}	Rhythmic Movement Training	4 ^b
Brain Gym	5 ^b	Wilbarger Protocol	4 ^b
Interactive Metronome	4 ^b	Therasuit	4 ^b
Makoto Therapy	4 ^b	Craniosacral Therapy	4 ^b

^a actual Wisconsin Determination Level designated by the Wisconsin Treatment Intervention Advisory Committee (Wisconsin Department of Health Services, 2016)

^b the intervention is limited or flawed, and is not recommended as an evidence-based intervention by the American Academy of Pediatrics (Myers & Johnson, 2007)

Web Content Analysis Preliminary Themes

Theme One: 53% of clinics websites viewed promote providing at least one of the 12 identified interventions

Theme Two: The three specified auditory interventions, Auditory Integration Therapy, The Listening Program, and Therapeutic Listening, are the most widely promoted. The three specified reflex and three specified movement interventions were promoted at similar levels to one another, but less frequently than auditory interventions. The one specified sensory-motor intervention was the least promoted of the twelve.

Theme Three: There is not a consistent method clinics are using to promote specified interventions and/or discuss payment options for services as part of the information their website provides. Also, there is little to no information on clinic websites regarding the appropriateness for use of these interventions with children on the Autism Spectrum.

Next Steps: Survey

Research Questions the Survey Will Attempt to Address:

- What percentage of Minnesota pediatric occupational therapy practitioners have an awareness or understanding of current interventions that could be considered comprehensive treatment models?
- What percentage of Minnesota pediatric occupational therapy practitioners are certified and regularly utilize each of these 12 treatment interventions in practice?
- How frequently are these 12 treatment interventions being used with children on the Autism Spectrum in Minnesota?

References

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Appendix M

Resources for Evidence-Based Information

Searching and evaluating research examining interventions for children with ASD can be frustrating for healthcare professionals (Abbey, 2009). Abbey (2009) and Arbesman et al. (2017) have provided a list of resources to help healthcare professionals and families with a child with ASD evaluate and find the evidence for treatments. Not everyone will be able to have access to some of the fee-based resources, but there are medical libraries and health science libraries that offer reference assistance.

Occupational Therapy Specific Resources

The Evidence Connection article “Occupational Therapy Interventions for Adolescents With Autism Spectrum Disorder” by Tomcheck, Koenig, Arbesman, and Lieberman (2017). This can be found within the *American Journal of Occupational Therapy (AJOT)*. This article offers an application of systematic reviews to provide an evidence-based approach to treating a child with ASD and translating findings into practice (Tomcheck, Koenig, Arbesman, and Lieberman, 2017).

Another place to locate new EBP resources is the AOTA’s EBP section of the AOTA website (Arbesman, Lieberman & Stutzbach, 2017). Critically Appraised Topics (CATs) are regularly added and can be downloaded as a pdf. CATs are short synopses of synthesized articles selected to answer a particular question within a practice area, including children with ASD (Arbesman, Lieberman & Stutzbach, 2017).

General Resources

National Center for Complementary and Alternative Medicine (NCCAM,
<http://nccam.nih.gov/>)

NCCAM conducts and sponsors research using advanced technologies and scientific methods to study CAM (Abbey, 2009). It is one of 27 institutes that compose the National Institutes of Health (NIH) (Abbey, 2009).

NIH Autism Research Network ([http://www. autismresearchnetwork.org/AN/default.aspx](http://www.autismresearchnetwork.org/AN/default.aspx))

The NIH Autism Research Network supports the Studies to Advance Autism Research and Treatment (SMART) Network and the Collaborative Programs of Excellence in Autism (CPEA) Network (Abbey, 2009). Both of these programs are dedicated to treating and understanding autism (Abbey, 2009).

The Cochrane Collaboration (<http://www.cochrane.org/index.htm>)

The Cochrane Collaboration provides accurate, up-to-date information regarding the effects of healthcare. It creates and disseminates systematic reviews of healthcare treatments, including those regarding children with ASD (Abbey 2009). The Cochrane Collaboration promotes the examination of evidence in the form of studies and clinical trials (Abbey, 2009).

E-Medicine (<http://emedicine.medscape.com/>)

E-Medicine offers evidence-based information, updated regularly by approximately 10,000 medical editors and authors (Abbey, 2009). E-Medicine provides the latest practice guidelines for 59 healthcare specialties, including occupational therapy (Abbey, 2009).

Health News in Review (<http://www.healthnewsreview.org/>)

Health News in Review reviews and rates the completeness and accuracy of health reports in the news (Abbey, 2009). This site offers information on health care treatments, costs of the treatments, and the quality of evidence examining those treatments (Abbey, 2009).

Medline Plus (www.medlineplus.gov)

Medline Plus is a free, peer-reviewed and evidence-based resource for consumers (Abbey, 2009). Medline Plus offers information regarding clinical trials, diagnosis, treatment, current news, statistics, and more. MedlinePlus is searchable in Spanish and English.

PubMed (www.pubmed.gov)

PubMed is a free database and searches can be limited to specific clinical study categories, such as occupational therapy. Searches can also be limited to systematic reviews and evidence-based medicine.

Appendix N

Guidelines for Professionals Considering the Use of CAMs

Though the use of complementary and alternative medicine (CAM) is not recommended by expert review groups (Myers & Johnson, 2007; Wisconsin Department of Health Services, 2016a), Kurtz (2008) has gathered guidelines and information concerning the decision-making process if practitioners are considering the use of CAMs. Some guidelines suggested by Kurtz (2008) for professionals considering the use of CAMs are:

- Examine carefully for evidence as to the potential effectiveness, efficacy, and safety of the treatment before incorporating a CAM into your intervention plan;
- Question whether the CAM qualifies within your scope of practice as outlined by your profession and by your regulatory agencies. It is your ethical responsibility as a health practitioner to practice within defined guidelines, especially if you represent yourself giving a professional service and expect to receive reimbursement as such;
- If you are employed by an agency (e.g. school system, rehabilitation center, hospital), be aware of the agency's policy on CAMs before recommending a treatment;
- Obtain information from insurance agencies as well as other payers to examine coverage prior to recommending a CAM to a patient;
- Clearly communicate all benefits and risks associated with the offered CAM treatment to parents and, if appropriate, to the child;
- Be very clear to parents in describing the proposed outcomes of the CAM intervention, and stop the treatment as soon as the intervention appears to be ineffective;
- Never insinuate to a parent that they have to agree to your recommendation. Your responsibility is to educate parents about the variety of options available to them, and to

converse the pros and cons of the range of options to the best of your ability.

Appendix O

Occupational Therapy Interventions for Children with ASD Supported by Evidence

Intervention	Description of Intervention	Findings	Research Studies
Applied Behavioral Analysis (ABA)*	Practitioners utilize behavioral science to address behavioral problems and learning in a variety of settings, including clinics and schools.	ABA is a well-established intervention that has substantial evidence to support children with ASD and their occupations. Web Link: https://www.autismspeaks.org/what-autism/treatment/applied-behavior-analysis-aba	(Eldevik et al., 2009) (Howlin, Magiati, & Charman, 2009) (Reichow & Wolery, 2009) (Spreckley & Boyd, 2009)
Cognitive Behavioral Intervention (CBI)	Clients are instructed to examine their thoughts and emotions, recognize negative thoughts, and then implement strategies to modify their thinking and behavior.	CBI has been shown to effectively address communication, social, behavior, adaptive, and mental health outcomes for children with ASD.	(Drahota, Wood, Sze, & Van Dyke, 2011) (Singh et al., 2011) (Sofronoff, Attwood, & Hinton, 2005) (Sofronoff, Attwood, Hinton, & Levin, 2007)
Cognitive Orientation to Daily Occupational Performance Approach (CO-OP)	The CO-OP Approach™ is a client-centered, cognitive-based approach that utilizes four methods to teach and transfer targeted skills: (1) skill acquisition, (2) strategy use, (3)	Research suggests that the CO-OP Approach™ is effective at developing the skill of transfer as an achievable outcome for different populations and ages, including those with ASD. Although a particular level of cognitive function is necessary for the CO-OP model to be implemented, it has shown to increase the occupational participation for children with ASD at a variety of ages.	(Phelan, Steinke, & Mandich, 2009) (Rodger, Springfield, & Polatajko, 2007) (Scammell, Bates, Houldin, & Polatajko, 2016)

	generalization, and (4) transfer.	Web Link: http://co-opacademy.ca/about-co-op/the-co-op-approach/	
Early Start Denver Model (ESDM)*	Occupational therapists use strategies from this model to work on shared interaction and joint attention.	Well-designed studies have concluded that the Early Start Denver Model is effective at improving language and autism symptoms. Web Link: https://www.autismspeaks.org/what-autism/treatment/early-start-denver-model-esdm	(Estes et al., 2016) (Dawson et al., 2009) (Vivanti, Dissanayake, Zierhut, Rogers, & Victorain ASELCC Team, 2012) (Vivanti et al., 2014)
Pivotal Response Training (PRT)	PRT builds on client interests and goals, while offering the power of choice and natural reinforcers in therapy to build responsivity to cues.	PRT has been shown to effectively address joint attention, social, communication, and play skills. Web Link: http://www.autismprthelp.com/	(Harper, Symon, & Frea, 2008) (Kuhn, Bodkin, Devlin, & Doggett, 2008) (Nefdt, Koegel, Singer, & Gerber, 2010) (Robinson, 2011)
Relationship Development Intervention (RDI)*	RDI is a family-based, behavioral intervention utilized to address the core symptoms of autism.	Though there is minimal evidence, RDI is an emerging intervention shown to be effective at improving a child with ASD’s ability to cope with change, integrate information from multiple sources, and build social interactions. Web Link: http://www.rdiconnect.com/about-rdi/	(Earbart & Zamora, 2015) (Gutsten, Burgess, & Montfort, 2007)
Treatment and Education of Autistic and related Communication	Utilizing physical organization, teaching, and scheduling, therapists can work to improve a client’s	TEACCH has been shown to improve cognition and motor skills for children with ASD Web Link: http://www.teacch.com	(Boyd et al., 2014) (Callahan, Shukla-Mehta, Magee, & Wie, 2010) (Panerai et al., 2009)

<p>Handicapped Children (TEACCH)</p>	<p>communication, sensory processing, and generalization of learning.</p>		
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Note. * covered by EIDBI benefit. Adapted from Case-Smith & Arbesman (2008) & Wong et al. (2014)

Appendix P

Ethical Considerations Concerning the Use of Non-Evidence-Based Interventions

Due to the increasing prevalence of new intervention methods in occupational therapy practice, the American Occupational Therapy Association has issued an advisory opinion for the ethics commission regarding the use of these new intervention techniques (Johns, 2016).

Decision making concerning choosing the most safe, appropriate, and effective interventions must be made based on experience, clinical reasoning, and available research evidence (Christiansen & Lou, 2001). Evidence-based practice is described as practice that utilizes the combination of clinical experience, client's unique circumstances and values, and best available research evidence (Law & MacDermind, 2014; Straus, et al., 2005; Wong et al., 2014).

Christiansen & Lou (2001) stated that, along with evidence-based practice, occupational therapy practitioners need to also consider ethical principles, such as doing the right thing, patient benefit, and avoiding harm. The AOTA Code of Ethics (2015) is occupational therapy's code of ethics which is used to provide guidance for appropriate conduct, ethical practice, and making decisions regarding the ethics of using less traditional interventions of occupational therapy practice (Johns, 2016).

Given the twelve specified interventions focused on for this thesis have a lack of evidence validating their effectiveness and safety regarding their use with children with ASD, occupational therapy practitioners need to consider ethical principles when deciding to implement these interventions. Practitioners must examine their own motivations, rationale (e.g., financial gain), and driving forces when choosing to use interventions that have little evidence supporting their efficacy (Johns, 2016). Nontraditional approaches (such as CAMs) can have positive effects to occupational therapy clients, but their use can pose significant ethical

challenges to practitioners looking to integrate them in to their current practice (Johns, 2016). Occupational therapy practitioners have the ethical responsibility of upholding the AOTA Code of Ethics (2015) to ensure they are promoting best practice for their clients and protect their clients from potentially ambiguous situations (Johns, 2016). The use of the specified twelve interventions as well as quotes stated by the focus group participants pose ethical implications, which are outlined below.

Beneficence

Practitioners have an ethical obligation to avoid areas of practice they have limited competence in (i.e., professional limitations) as well as have the duty to ensure their intervention methods are safe and effective for their clients (Johns, 2016). The principles regarding beneficence can be used to assist practitioners in making decisions about incorporating emerging or nontraditional interventions into their practice (Johns, 2016). The principle of beneficence focuses on the occupational therapy practitioners' duty to utilize interventions that they can rationally expect to benefit clients; have safe and effective outcomes, and improve their quality of life, such as preferring evidence-based interventions over experimental treatment methods (AOTA, 2015; Johns, 2016). This is especially important when considering the use of a CAM in practice. AOTA has stated that, due to many CAMs still needing to be evaluated concerning their effects on occupational participation, it's essential occupational therapy practitioners attain a high level of competence when utilizing a CAM (AOTA, 2005). This level of competence may include required additional training, certification, regulatory knowledge, and competency examinations (AOTA, 2005). The following selected principles from the American Occupational Therapy Association's Occupational Therapy Code of Ethics (2015) concerning beneficence (2015):

- Beneficence: Principle 1. “Occupational therapy personnel shall demonstrate a concern for the well-being and safety of the recipients of their services” (AOTA, 2015, p. 2).
- 1C. “Occupational therapy personnel shall use, to the extent possible, evaluation, planning, intervention techniques, assessments, and therapeutic equipment that are evidence-based, current, and within the recognized scope of occupational therapy practice” (p. 2).
- 1F. “Occupational therapy personnel shall take steps (e.g., continuing education, research, supervision, training) to ensure proficiency, use careful judgement, and weigh potential for harm when generally recognized standards do not exist in emerging technology or areas of practice” (p. 3).
- 1G. “Occupational therapy personnel shall maintain competency by ongoing participation in education relevant to one’s practice area” (p. 3).

Selected Focus Group Quotes Concerning the Principle of Beneficence.

- *“similar to others in the Wilbarger Protocol except it was not like a formal training. I’ve been trained by those who have gone to the training.”*
- *“Brain Gym... is informally used a lot by myself as well as...speech therapists, special education teachers...”*
- *“Reflex Integration...I’ve just had...information from people that have been trained in it. I have not gone through the formal training.”*
- *“I do advocate for some of these...treatment protocols with parents but it would have to happen in the private setting.”*

- *“I would say it's probably not being used (Brain Gym) to fidelity or the way that it should or was designed to be used...people are picking and choosing...what would work for them...in the school setting.”*
- *“I always chose the cheapest easiest things, which weren't always related to what I needed to know as an OT working in the schools.”*
- *“...they're used because even though the evidence isn't behind them...through your training or through your use with kids you find them beneficial so then...they just are still being used.”*

Nonmaleficence

Nonmaleficence concerns preventing foreseeable harm that may be caused by utilizing treatment method where the effectiveness and safety have not yet been determined (AOTA, 2015; Johns, 2016). Also, this ethical code pertains to financial incentives pertaining to providing these specified interventions (AOTA, 2015; Johns, 2016). For example, if a private clinic owner has made a significant investment into a particular intervention, they may be inclined to endorse or maximize the use of the intervention for financial gain (AOTA, 2015; Johns, 2016). The following selected principles from the American Occupational Therapy Association's Occupational Therapy Code of Ethics (2015) concerning nonmaleficence are:

- Nonmaleficence: Principle 2. “Occupational therapy personnel shall refrain from actions that cause harm” (AOTA, 2015, p. 3).
- 2F. “Occupational therapy personnel shall avoid dual relationships, conflicts of interest, and situations in which a practitioner, educator, student, researcher, or employer is unable to maintain clear professional boundaries or objectivity” (p. 4)

- 2I. “Occupational therapy personnel shall avoid exploiting any relationship established as an occupational therapy clinician, educator, or researcher to further one’s own physical, emotional, financial, political, or business interests at the expense of recipients of services, students, research participants, employees, or colleagues” (p. 4).

Selected Focus Group Quotes Concerning the Principle of Nonmaleficence.

- *“Therapeutic Listening and...Interactive Metronome I was trained in only because it was offered at the clinic and they needed a certain amount of people...to do it.”*
- *“We are dependent...upon the private companies that say ‘these are really good things and do this’...there just really isn’t many alternatives.”*
- *“I went through the formal training for Interactive Metronome because the clinic...had the program and wanted everyone...to go through the training”*
- *“someday I would like to get trained in on ... my organization just has it and they’ve seen it to be effective and useful and since we have the equipment it’s a good thing to learn because we can’t always be getting new stuff”*
- *“It was part of the training when I started by job ... AIT ... Wilbarger ... Therasuit ... one on one training with someone who was formally trained ... til they felt comfortable that they were on your own with it”*
- *“It depends on what you call ‘evidence-based practice.’... peer-review journals is what of course the insurance companies are looking for and*

what doctors are looking for... and we just don't have access to that...so some of the...things that we do are a little bit anecdotal... it goes away from the scientific model.”

Autonomy

Autonomy pertains to respecting clients’ interests, values, privacy, preferences, and their right to make their own decisions when considering treatment, even if their decision are not fully in agreement with their practitioners’ recommendations (AOTA, 2015; Johns, 2016). Respecting a patient’s right to informed consent is another essential role of autonomy (AOTA, 2015; Johns, 2016). Informed consent is a patient’s right to a full disclosure of what is to be predicted in terms of outcomes, plan of care, and the unknown and known risks or benefits concerning a therapy service when making a decision based on that information (AOTA, 2015; Johns, 2016). The following selected principles from the American Occupational Therapy Association’s Occupational Therapy Code of Ethics (2015) concerning autonomy are:

- Autonomy: Principle 3. “Occupational therapy personnel shall respect the right of the individual to self-determination” (AOTA, 2015, p. 4).
- 3D. “Occupational therapy personnel shall establish a collaborative relationship with recipients of service and relevant stakeholders to promote shared decision making” (p. 4).
- 3E. “Occupational therapy personnel shall respect the client’s right to refuse occupational therapy services temporarily or permanently, even when that refusal may result in poor outcomes” (p. 4).

Selected Focus Group Quotes Concerning the Principle of Autonomy.

- *“Typically I teach it to their parents and ... recommend a protocol of two weeks six times a day if they can do that. And um a lot of parents find that really hard to do and I understand that. So I tell them to instead of doing once or twice a day ... willy-nilly ... to better find a two or three day period where they can consistently do it six times a day ... and be motivated to ... follow through for two weeks”*
- *“I just tell parents ‘you know just try it this way and you’ll see if it’s gonna benefit you and your child or not. If you don’t see the benefit ... then we’re not gonna keep at it”*
- *“The parents ... not many of them ask about research but I just say you know we’ll just everybody’s different we’ll just try it with your child and see ... what works”*
- *“Kind of explaining how ... you can have two kids with autism and they can have present themselves very similarly ... you can’t necessarily use the same type of approaches with those two kids cause it is so individualized especially when you’re looking at sensory ... having them be open to trying things but then really looking at how the child is responding”*
- *“you know just everybody that goes to this particular place gets brushing or everybody is gonna do the Listening Program ... it is kind of not specific to each kid but more of a general prescriptive thing”*

- *“people get set in their methods and there they get kind of on their um high horse about a certain method or certain thing that works and they don't aren't objective about it”*

Justice

Justice pertains to the professional responsibility of ensuring competence in occupational therapy by being familiar with applicable current research (AOTA, 2015; Johns, 2016).

However, if there is no evidence existing in the literature pertaining to an intervention method, professional resources should be examined and used to examine the outcomes of occupational participation (e.g., the Occupational Therapy Practice Framework; AOTA, 2014) (AOTA, 2015; Johns, 2016). It is the obligation of practitioners to maintain competency in current practice by attending specialty training and attaining appropriate certification to adequately and competently deliver services (AOTA, 2015; Johns, 2016). The principle of justice also concerns how it is the ethical and professional obligation of occupational therapy practitioners to comply and be familiar with state licensure regulations that govern conduct and the practice by a practitioner (AOTA, 2015; Johns, 2016). Practitioners may need to interpret regulations from state licensure boards to examine whether emerging interventions are within their scope of occupational therapy practice (AOTA, 2015; Johns, 2016). The following selected principles from the American Occupational Therapy Association's Occupational Therapy Code of Ethics (2015) concerning justice are:

- Justice: Principle 4. “Occupational therapy personnel shall promote fairness and objectivity in the provision of occupational therapy services” (AOTA, 2015, p. 5).

- 4G. “Occupational therapy personnel shall hold requisite credentials for the occupational therapy services they provide in academic, research, physical, or virtual work settings” (p. 5).

Selected Focus Group Quotes Concerning the Principle of Justice.

- *“It’s not part of my regular daily practice (reading journals and staying up to date on research evidence) because of all the responsibilities.”*
- *“...I would like to see...whether it be MOTA or... St. Kate’s ... at least provide some...leadership to...in the field...in areas that we should be...knowledgeable about and I don’t know what those areas are because I don’t...that’s not really my area of expertise. I just work with kids in a school, and I’m...I have a lot of other things going on in my life...I’m not sure that...I don’t want it to be my job to stay on the forefront.”*

Veracity

Veracity addresses two concepts that pertain to ethical decision making, which include transparency and vulnerability (AOTA, 2015; Johns, 2016). Transparency concerns how occupational therapy practitioners are required to provide full disclosure of the benefits and risks of an intervention method, including the rationale for why they selected that modality as well as the lack of research, if applicable (AOTA, 2015; Johns, 2016). Vulnerability applies to patients with disabilities and their caregivers (AOTA, 2015; Johns, 2016). For instance, parents of children with ASD, like many parents, are vulnerable because they are willing to try any available treatment method they believe may assist their child improve their functional performance (Johns, 2016). In some cases, all therapeutic options have been exhausted so a new or untested intervention becomes available and caregivers may be in danger of being exploited

because they seek positive outcomes (Johns, 2016). Therefore, parents may be susceptible to expensive interventions that are untried (Johns, 2016). Vulnerability consists of the therapeutic relationship between the practitioner and client regarding the issue of trust due to clients trusting the practitioner to protect their well-being (AOTA, 2015; Johns, 2016). The following selected principles from the American Occupational Therapy Association's Occupational Therapy Code of Ethics (2015) concerning veracity are:

- Veracity: Principle 5. "Occupational therapy personnel shall provide comprehensive, accurate, and objective information when representing the profession" (AOTA, 2015, p. 6).
- 5A. "Occupational therapy personnel shall represent credentials, qualifications, education, experience, training, roles, duties, competence, contributions, and findings accurately in all forms of communication" (p. 6).
- 5B. "Occupational therapy personnel shall refrain from using or participating in the use of any form of communication that contains false, fraudulent, deceptive, misleading, or unfair statements or claims" (p. 6).

Selected Focus Group Quotes Concerning the Principle of Veracity.

- *"...I would look at those prior to doing the intervention to see if it is ... that would be covered (by insurance). If it wasn't we look at other ways that we could embed it..."*
- *"...we have been told not to use that (MNRI) as something in our daily notes as well."*
- *"It's been requested by parents (Wilbarger Protocol) from...based on private clinic recommendations"*

- *“I take pieces of some of these ideas, some of these theories, these practices, and put them in place but very seldom would I use the whole protocol ... being able to take what pieces of it that seem to make sense for us”*

General Ethical Consideration Questions

Johns (2016) and Slater (2004) have compiled a list of ethical questions to consider when determining whether a treatment decision is ethical when using nontraditional interventions due to practitioners needing to meet both ethical and legal criteria:

1. “Does the client fully understand the risks and benefits, effectiveness, and safety factors associated with a new, nontraditional intervention when evidence is not available or is limited? Some risks may be unknown.” (Johns, 2016, p. 3).
2. “Has existing, relevant literature been shared with the client regarding the proposed utility of an emerging technology-based treatment?” (Johns, 2016, p. 3).
3. “What considerations should direct the ethical decision-making process when evidence is limited or the research does not demonstrate effectiveness?” (Johns, 2016, p. 3).
4. “Was this body of knowledge (*concerning unavailable or limited evidence*) part of my educational program?” (Slater, 2004, p. 16).
5. “Am I competent to provide this intervention based on past education or current and continuing education?” (Slater, 2004, p. 16).
6. “Is this intervention or practice usual and customary among occupational therapy practitioners, and would many of them agree? If not, is it defensible and consistent with the occupational therapy scope of practice utilizing criteria previously outlined?” (Slater, 2004, p. 16).

7. “Has the practitioner sought clarification from the state licensure board in providing clarity to the less-defined emerging areas of practice within the scope of practice?” (Johns, 2016, p. 8)
8. “Has the practitioner used AOTA’s resources, such as position papers or official documents related to this practice area?” (Johns, 2016, p. 8)
9. “Is this occupational therapy?” (Slater, 2004, p. 16). Is occupational used to facilitate engagement in meaningful activities and life roles?” (Johns, 2016, p. 8)