Parent Perception of the Effect of Integrative Movement Therapy on Social Participation in Children with an Autism Spectrum Disorder

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Abstract

The purpose of this descriptive study was to examine parent perspectives of the effect of Integrative Movement Therapy (IMT), a yoga-based therapy, on social interaction in school age children with an autism spectrum disorder (ASD). A survey was completed by 7 parents of children ages 6-12 diagnosed with an ASD who participated in IMT for an average of once a week for at least 3 months. Data collection included demographic information, history of participation in IMT, social skills, and parent perceived outcomes. Four areas of social development were addressed including (1) Maintaining Interactions (2) Responding to Initiations, (3) Initiating Interaction, and (4) Affective Understanding/ Perspective Taking. Parents retrospectively rated their child's social skills before and after participation in IMT. A two-tailed paired *t*-test for all social skills questions combined suggested that participation in IMT had a significant positive effect on social skills of the children in this study. Other areas of behavior reported to be affected by participation in IMT included increased ability to self-calm, increased body awareness, and ability to maintain appropriate personal space, and ability to modify self stimulating behavior. One must take into consideration the small sample size ($n = 7$) when attempting to generalize these findings to a larger population.

Children with autism have difficulty initiating social interactions and often exhibit repetitive motor behavior (Loftin, Odom, & Lantz, 2008), leading some to consider social dysfunction as the most defining characteristic of autism spectrum disorders (ASD) (Rogers, 2000). Promoting social participation is a vital part of occupational therapy intervention (Hilton, 2010). According to the American Occupational Therapy Association (AOTA) (2008), "the defining contribution of occupational therapy is the application of core values, knowledge, and skills to assist clients to engage in every day activities or occupations that they want and need to do. . . " (p. 626). As a child gains social skills, he or she can participate in meaningful occupations of childhood. Through social interactions, children can achieve specific developmental milestones and occupational goals. Thus, poor social skills may limit individuals in all aspects of their lives as they mature (Hilton, 2010). Therefore improving social function is one of the most important goals of intervention outcomes for professionals working with children with an ASD (Rogers, 2000).

The ability to engage in effective social interactions involves the integration of verbal and nonverbal components of language and communication (Audet, 2010). The verbal aspects include both expressive and receptive language (Audet, 2010). The nonverbal aspects include, but are not limited to, eye-gaze, gestures and facial expressions (Audet, 2010). Audet identifies the four fundamental aspects of communication as being receptive language, comprehension of nonlanguage aspects of communication, use of nonlanguage aspects of communication, and development of internalized language (Audet, 2010).

Socialization and social interaction are linked to language and communication (Audet, 2010). In several studies, social initiation and social interaction are used as dependent variable measures to examine social ability in children with autism (Rogers, 2000). Social behaviors such as proximity to other children, time spent looking at peers during play, and time engaged socially have also been used to measure social communication abilities (Rogers, 2000).

Children with an ASD have been found to be responsive to a wide variety of interventions aimed at increasing their social engagement (Rogers, 2000). Such interventions include those utilizing peer-mediated and adult administered interventions such as modeling, prompting, sensory based, developmental, and cognitive-behaviorally based methods (Rogers, 2000). A less studied intervention is that of yoga-based therapy. Yoga-based therapy is a promising approach for children with an ASD. Yoga helps children with autism achieve a calm state internally, rather than relying on an external source for calming. One specific type of yoga-based therapy is Integrative Movement Therapy (IMT). IMT encourages increased body awareness and thus provides a method for a child to explore their ability to have control over their body (Kenny, 2002). The relative safety of yoga allows children to explore their bodies and gain a sense of physical self-confidence (Kenny, 2002). According to Kenny (2002), increasing body awareness is crucial to developing social skills. Increased proprioceptive and tactile awareness, through yoga, can ultimately increase social skills by helping the children to recognize and respect appropriate personal spatial boundaries (Kenny, 2002). Specific improvements in social communication as a result of IMT may include verbal

identification of poses from picture cards and the initiation of and engagement in social interactive play routines involving turn taking and direct eye contact (Kenny, 2002).

Background and Significance

Autism spectrum disorders. Autism is a developmental disorder that originates prior to birth or early in infancy and is defined on the basis of observed or described behaviors (Lord & Risi, 2000). The term autism spectrum disorder is used to refer to a wide spectrum of neurodevelopmental disorders characterized by "the presence of markedly abnormal or impaired development in social interaction and communication and a markedly restricted repertoire of activity and interests." (APA, 2000, p. 70).

Impairment in reciprocal social interaction is marked by difficulty with the use of nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction (APA, 2000). Failure to develop age appropriate peer relationships as well as lack of spontaneous seeking to share enjoyment, interests, or achievements with other people are also indicators of impaired development in social interaction (APA, 2000). Behaviors such as preferring solitary activities or not actively participating in social play games may be present (APA, 2000).

Impairment in communication involves both verbal and nonverbal skills. Such impairments are marked by a delay in or lack of the development of spoken language, impairment in the ability to initiate or sustain a conversation with others, stereotyped or repetitive use of language, and lack of developmentally appropriate social imitative or make-believe play (APA, 2000). When speech does develop in children with an ASD, the pitch, intonation, rate, rhythm, or stress maybe abnormal (APA, 2000). Language comprehension also is often delayed (APA, 2000).

Individuals with an ASD also "have restricted, repetitive, and stereotyped patterns of behavior, interests and activities" (APA, 2000, p. 71). According to the diagnostic criteria for autism, such behaviors include one of the following "a) abnormal preoccupation with one or more patterns of interest, b) inflexible adherence to specific routines or rituals, c) stereotyped and repetitive motor mannerisms, or d) persistent preoccupation with parts of objects" (APA, 2000, p. 75).

Associated features often present with an ASD include a diagnosis of mental retardation ranging from mild to severe as well as a range of behavioral symptoms (APA, 2000). Such behavioral symptoms include odd responses to sensory stimuli, hyperactivity, short attention span, aggressiveness, impulsivity, and self-injurious behavior (APA, 2000). Abnormalities of mood or affect including an absence of emotional reactions, or giggling or weeping for no apparent reason may be present (APA, 2000). In addition, there may be a lack of fear in response to real dangers, and excessive fear in response to harmless objects (APA, 2000).

The number of children diagnosed with an ASD has increased in the past 10 years (Case-Smith & Arbesman, 2008). According to the most current Centers for Disease Control and Prevention (CDC) data, approximately 1 in 110 children in the U.S. are diagnosed as having an ASD. The overall identified prevalence increased 60% among males and 48% among females between 2002 and 2006 (CDC, 2010). Children with an ASD have a continuum of occupational and performance problems that interfere with their ability to engage in school, home, and community activities (Case-Smith & Arbesman, 2008). Due to the increase in children diagnosed with an ASD, a need for

services and programs that facilitate participation in everyday activities, such as social interaction and communication, are gaining importance.

Occupational therapy

Occupational therapy and ASD. The Occupational Therapy Practice Framework, 2nd Edition: Framework-II (AOTA, 2008) identifies the role of occupational therapy as "promoting health and participation through engagement in occupation" (p. 625). Occupational therapists evaluate and provide intervention for individuals with an ASD in order to enable the individual to engage in desired occupations or activities that support health and participation in the home, school, and community environments (AOTA, 2008; Watling, Tomchek, & LaVesser, 2005). "For an individual with an ASD, the domain of occupational therapy services is defined according to that individual's goals and priorities for participation" (Watling et al., 2005, p. 680). Some examples of such priorities include self-care, education, leisure and play, social participation, and work (Watling et al., 2005).

Occupational therapy and social participation. One of the occupations addressed by occupational therapy practitioners is social participation. The Framework-II (AOTA, 2008) defines social participation as "organized patterns of behavior that are characteristic and expected of an individual or a given position within a social system" (p. 633). Social participation includes engagement with community, family, and peers or friends (Hilton, 2010). The Framework-II (AOTA, 2008) also defines communication and social skills as "actions or behaviors a person uses to communicate and interact with others in an interactive environment" (p. 641). The fundamental features of communication include the ability to attend to and use non-verbal communication

behaviors, the ability to interpret and convey emotional states, and the ability to shift roles as initiator and responder in a social context (Audet, 2010). Communication and social skills are therefore necessary for effective social participation.

Occupational therapy interventions for social participation. Occupational therapists utilize a variety of different intervention approaches when working with children with autism spectrum disorders to improve social interaction and engagement with an end goal of improving social participation. Such approaches include sensory-based interventions, relationship based and interactive interventions, and social skills interventions (Case-Smith & Arbesman, 2008).

Many children with an ASD have atypical processing of sensory information which is highly correlated with social impairment (Hilton, 2010). Baranek (2002) suggested that improved sensory integration may enhance a child's ability to participate in social interaction and modulate their behavior. According to Baranek (2002), occupational therapy studies of the effects of sensory integration approaches with children suggest that sensory integration intervention seems to improve self modulation of behavior and participation in social interaction. Although sensory integration has been positively associated with changes in social interaction, one major limiting factor is that many of the studies fail to directly link changes in sensory dysfunction to functional changes in behavior (Baranek, 2002).

Relationship based interventions aim to improve fundamental aspects of autism to enhance a child's ability to show emotions in relationships with others. Giving attention and responding to the child are critical aspects of developmental, relationship based

approaches. Research of relationship-based interventions revealed positive results in the area of social-emotional growth and pivotal behaviors (Case-Smith, 2010).

Intervention programs to enhance social skills include social skills groups, cognitive-behavioral therapy, and Social Stories (Case-Smith, 2010). Occupational therapists frequently administer social skills groups with simple social rules that emphasize cooperative play and provide a safe, consistent, cooperative environment (Case-Smith, 2010). Studies on the use of social skills groups show a positive effect on social interaction skills of children receiving the intervention. LeGoff (2004) and LeGoff and Sherman (2006) conducted studies examining the effects of LEGO© therapy on social competence in children with an ASD with an emphasis on cooperative play. Both studies resulted in an increase in social interaction, including initiation of social interaction, with peers and duration of social interaction with peers after participation in LEGO© therapy.

Cognitive-behavioral interventions strive to enhance theory of mind in children in order to allow children with an ASD to predict behaviors of others and thus "participate in conversations or activities with others in which reciprocity is expected" (Case-Smith, 2010, p. 713). Studies of interventions that emphasize the development of theory of mind skills reveal some benefits yet the ability of children to generalize these skills to other environments may be limited (Case-Smith, 2010). Bauminger (2002) examined the effectiveness of a cognitive behavioral intervention designed to improve theory of mind in children with an ASD. Results of the study indicated a positive change in social and emotional understanding as well as a positive change in observed social interactions.

Social Stories (Gray, 2000) are stories about the social behaviors expected in different situations and environments and are often implemented by occupational

therapists (Case-Smith & Arbesman, 2008). Reynhout and Carter (2006) reviewed the empirical research literature on the effects of Social Stories for children with autism spectrum disorder. They concluded that the use of Social Stories resulted in some positive behavioral changes including appropriate increases or decreases in target behaviors such as greeting peers, asking a peer to play, sharing, disruptive behaviors, solitary play, and inappropriate communication. Generalization of these results is limited due to much variety in the age and abilities of the sample population across studies.

Many studies regarding interventions used with children with an ASD have incorporated parent perception as a means to validate the intervention. Allgood (2005) examined parents' perceptions of family-based group music therapy for children with ASD. Parents in this study also participated in the intervention strategy (music therapy sessions). Parents' perception of the intervention were used to formulate data regarding the effect of the intervention on the children participating in the music therapy group-based sessions. Parents reported increased interaction between children with each session as well as an increased awareness of their child's abilities and limitations. Murray, Ruble, Willis, and Molloy (2009) examined the differences between parent and teacher report of social skills in children with ASD as measured by the TRIAD Social Skills Assessment. Their findings support the theory that "discreet social behavior may be context bound" (p. 113), thus providing an argument for the use of multiple informants in assessing social functioning in children with ASD.

While there are various types of interventions aimed at improving social participation in children with an ASD, therapists still encounter the great challenge of utilizing the best combination of intervention approaches to most effectively serve and

treat an individual child. Thus, there is a need to continually consider new or emerging intervention methods to increase the options available to therapists and effectiveness of services to clients.

Yoga. Yoga is a mind-body practice that originated in India at least 2000 years ago (Birdee et al., 2009). Yoga is a method by which the restless mind can be calmed and the energy directed to constructed channels (Iyengar, 1995). The undertaking of yoga concerns the entire person, resulting in a reshaping of mind, body, and emotions (Ravindra, 2006). Through yoga a person can become *sanskrita* (literally: well made, well put together) (Iyengar, 1995).

Yoga was systematized by the philosopher Patanjali in his classical work, the *Yoga Sutras* (Iyengar, 1995). According to this text, the purpose of yoga is to lead to a silence of the mind (Ravindra, 2006). The core of Patanjali's *Yoga Sutra* is an eight-limbed path which essentially are guidelines on how to live a meaningful and purposeful life. These eight limbs are Yama, Niyama, Asanas, Pranayama, Pratyahara, Dharana, Dhyana, and Samadhi (Iyengar, 1995). The Yama (universal moral commandments) and Niyama (self purification by discipline) are believed to control the yogi's passions and emotions and keep him in harmony with his fellow man (Iyengar, 1995). Asanas (posture) are used to keep the body healthy and strong and in harmony with nature (Iyengar, 1995). Pranayama (rhythmic control of the breath) and Pratyahara (withdrawal and emancipation of the mind from domination of the senses and exterior subjects) are used to teach the individual to regulate breathing and thereby control the mind. Dharana (concentration), Dhyana (meditation), and Samadhi (a state of super consciousness brought about by profound meditation) are believed to keep the individual in harmony

with himself and his maker (Iyengar, 1995). Thus, "yoga is inherently, in its fullest expression, a discipline that encourages total personal development, encompassing physical, emotional, intellectual, spiritual, and social growth" (Kenny, 2002).

Yoga-based therapy. A type of intervention, which incorporates aspects of sensory-based approaches and relationship-based approaches is yoga-based therapy. The *Asanas,* or physical aspect of yoga, provide vestibular, proprioceptive, and tactile input which help to create body awareness. Interactions with the yoga instructor and other children in a yoga therapy session provide opportunities for the formation and development of social relationships. Kenny (2002) emphasized that increasing body awareness is crucial to developing social skills. Brownstone (as cited in Kenny, 2002) commented, "all aspects of yoga practice encourage development of awareness of the relationship between the nervous system and somatic activity and thoughts and feelings. With increased awareness and training of the mind, inhibition of unwanted responses becomes possible" (p. 75).

These concepts are similar to the foundational beliefs of sensory integration theory, an approach to occupational therapy that is often used with children with an ASD. According to the sensory integration perspective, engagement in activities which allow for vestibular, proprioceptive, and tactile sensory input can improve the ability of the brain and nervous system to process sensory information and organize the nervous system (Lane & Schaaf, 2010). Integration of the vestibular system with proprioceptive and visual systems is promoted in many yogic postures (Brownstone, 2001). Mollo, Schaaf, and Benevides (2008, September) conducted a study examining the use of Kripalu yoga to decrease sensory overresponsivity in adults with sensory defensiveness.

Kripalu yoga involves heavy work, deep breathing, and intense attention. The results indicated that participants of the study demonstrated a significant increase in baseline vagal tone after the yoga intervention, supporting the assumption that yoga practice can increase parasympathetic nervous system activity, thus enhancing homeostasis and self regulation (Mollo et al., 2008, September). However, the study included small sample size, older age of participants, and lacked a control group.

A search of the current literature regarding yoga therapy and children with an ASD revealed that yoga therapy and movement therapy both resulted in increased attentive behavior, decreased stress, less time wandering, as well as changes in communication, language, play, and joint attention (Hartshorn, Olds, Field, Delage, Cullen, & Escalona, 2001; Radhakrishna, 2010; Radhakrishna, Nagarathna, & Nagendra, 2010). Although these studies revealed positive results, none examined the effects of yoga therapy specifically on social participation in children with an ASD.

Integrative Movement Therapy (IMT). Integrative movement therapy is an approach which combines the use of movement (yoga specifically) with a yogic based philosophical view of humans that can be implemented in a group or individual setting. IMT principles draw from several disciplines including "speech-language pathology, behavioral and mental health counseling, and yoga" (Kenny, 2002, p. 71). IMT was developed to take advantage of the positive effects of movement, specifically yoga, and to directly affect frontal lobe function thus improving therapeutic outcomes in children with an ASD (Kenny, 2002). IMT utilizes interactive strategies to improve social communication and interaction in children with an ASD. In addition, IMT has a yogic based spiritual and philosophical component that separates it from conventional clinical

interventions. IMT focuses on "the divine being that exists within each child, no matter how distracting the external manifestations of the 'diagnosis' might be" (Kenny, 2002, p. 78). IMT therefore focuses on what's "*right* about the child, the goodness or divinity of the individual" (Kenny, 2002, p. 78). IMT is provided only by certified IMT therapists. To become certified as an IMT therapist, an individual must complete a specific yoga teacher training, 74 hours of IMT training workshops, a 5-day IMT advanced retreat, and a 1-month (approximately 128 hours) certification internship to gain hands on experience (Samarya Center, 2010).

According to Kenny (2002) IMT has six core principles, each of which corresponds to specific areas of deficit associated with an ASD. These principles include "structure and continuity, physical stimulation, social interaction, language stimulation, self-calming, and direct self-esteem building" (Kenny, 2002, p. 73). During the IMT session, structure and continuity are established through routine and repetition, which are characteristics of traditional Ashtanga Yoga classes. The rules of the yoga studio, the physical boundary created by a yoga mat, the routine of taking off shoes, and the creation of a schedule all provide a consistent routine and structure that help to build confidence and competence. Much of the physical practice in the IMT session aims to increase sustained attention, behavioral regulation, and general body awareness. Inversions, such as handstands, stimulate the vestibular and proprioceptive systems and can also have a significant effect on a child's self-confidence by not only increasing strength and coordination but also increasing courage and appropriate risk-taking behaviors. Because IMT is noncompetitive, it creates an ideal environment in which to encourage risk-taking

and increase self-confidence, which are important in creating an optimal state for learning (Kenny, 2002).

IMT also incorporates relationship-based methods. In a one-on-one setting, the therapist facilitates social interaction and language stimulation through the use of yoga games. Children learn a variety of poses categorized in terms of animals or objects, body positioning, and Sanskrit names (Kenny, 2002). The child and therapist can then interact through games that involve describing and guessing specific yogic postures from cues and creating stories with specific animal yoga poses. Such games focus on turn-taking, motor and verbal imitation, motor planning, developing communicative intent, planning, and abstract thinking (Kenny, 2002). In a group setting, children can interact socially in a similar manner through the use of yoga games which focus on the same skills as well as the skill of relating to peers. Through participation in these games, children learn how to be the leader of the group as well as a follower. Children are motivated by a common goal of engaging in yoga-based activities and often develop relationships based on that goal (Kenny, 2002). Specific examples of improvement in social communication and interaction following IMT sessions include "initiation of and engagement in social interactive play routines involving turn taking and direct eye contact, increased time with activity, and imaginative and symbolic play" (Kenny, 2002, p. 77).

A search of the current literature revealed that there is a lack of research examining the effects of Integrative Movement Therapy on social participation in children with an ASD. Kenny (2002) described the theoretical framework of IMT and its application to children with an ASD. While this article thoroughly describes the components of IMT and how they relate to children with an ASD, it does not present

rigorous evidence based support for the effects of IMT on this population. IMT certified therapists have been involved in research examining the effects of chanting on individuals with depression (Kenny, Bernier, & DeMartini, 2005), and the effects of training balance in teens on measures of self-esteem (Kenny & Bernier, 2007). While both studies revealed moderately positive results, neither study examined IMT specifically nor did they involve children with an ASD. Thus, this study intends to examine parent perception of the effect of IMT on social participation in children with an ASD.

Method

Research Design

This study was designed to examine parent perspectives, including attitudes and beliefs, about the effect of Integrative Movement Therapy (IMT) on social interaction of school age children diagnosed with an ASD. A descriptive design, utilizing a mail survey research method, was used.

Participants

Participants were parents of children with an ASD who received Integrative Movement Therapy in the Pacific Northwest (n = 7). Inclusion criteria for this study were 1) 6-12 years while participating in IMT, 2) a diagnosis of an ASD, 3) received IMT within the past 7 years by a certified IMT therapist, and 4) received at least 3 months of IMT for on average of once a week.

Instrumentation

The data collection tool was a questionnaire developed specifically for this study (see Appendix A). The questionnaire contained four parts: demographic information, history of participation in IMT, social skills, and outcomes. The questionnaire was

developed utilizing information from current research pertaining to the development of social skills in children. The social skills portion used questions taken from the TRIAD Social Skills Assessment (TSSA, Stone, Ruble, Coonrod, Hepburn, & Pennington, 2003) with permission from the authors. This portion of the questionnaire was divided into four sections: (1) Maintaining Interactions (2) Responding to Initiations, (3) Initiating Interaction, and (4) Affective Understanding/ Perspective Taking. The TSSA has been used previously to document social skills in children with ASD (Murray, Ruble, Willis, & Molloy, 2009). The researcher added one question to the Affective Understanding/Perspective taking section. When completing the social skills portion of the questionnaire, parents were asked to report on their child's social skills before and after participation in IMT. Parents circled a Likert score rating for *before IMT* and *after IMT* for each social skills question. The Likert scores ranged from one, *"not very well",* to four, *"very well"*.

The demographic and history of participation in IMT portions of the questionnaire contained questions pertaining to sex, current age of the child, age at start of therapy, length of time receiving IMT, frequency of IMT sessions, and other forms of therapy the child received prior to and during participation in IMT. Parents were asked to report on their perceptions of the therapy's effectiveness and other areas of improvement in the outcomes portion of the questionnaire.

A draft questionnaire was reviewed by two expert pediatric occupational therapists to gain feedback. After incorporating feedback regarding face validity and content validity, the revised questionnaire was pilot tested with a parent of a child with an

ASD who had participated in some form of yoga. Feedback from the pilot questionnaire was used to ensure readability and ease of completing the questionnaire.

Procedures

Sample. The researcher utilized a convenience sampling method and worked in conjunction with Integrative Movement Therapists at the Samarya Center to acquire willing participants. A Samarya Center staff member reviewed past client files and identified those pertaining to children who met the inclusion criteria for the study (n = 12).

Implementation. Following approval by the university Human Subject Review board, a Samarya Center staff person contacted via telephone all clients identified as meeting the inclusion criteria. This initial contact served as a means to verify contact information and obtain permission to mail the research packets to each family. The researcher prepared and delivered to the Samarya Center research packets containing a cover letter (see Appendix B) with instructions, the questionnaire, and a stamped, addressed return envelope. A Samarya Center staff member addressed and mailed packets to the potential participants. As a result, the researcher did not see any identifying information of the participants thus protecting participant confidentiality. Two weeks after the initial mailing, a second set of research packets were prepared and given to the Samarya Center to be addressed and mailed. In an effort to minimize workload and confusion on the part of Samarya Center staff members, the second set of research packets were sent to all potential participants. This eliminated the need to track returned questionnaires. The second packets included a letter thanking those who had already completed and returned the questionnaire and asking them to disregard the second

mailing. The second cover letter urged those who had not responded to do so within 10 days. Approximately 14 days after the second mailing a Samarya Center staff member called and left voice messages for all participants enquiring whether they intended to complete the questionnaire in order to increase the response rate. In order to preserve confidentiality participants were asked to not report any identifying information when completing the questionnaire.

Data Analysis

The responses from the questionnaire were coded and entered into Microsoft Excel to organize and analyze the data. Frequency counts and averages were used to summarize demographic information and IMT participation information from each respondent. Likert score ratings on questions pertaining to social skills were summed per respondent for the before IMT and after IMT scores. Each respondent's total sum score as well as sum per section for before IMT and after IMT were entered into Microsoft Excel in order to run a two-tailed paired *t*-test. Thus, all questionnaire section scores combined were analyzed across respondents as well as each separate section across respondents. The open-ended questions in which parents reported why they chose IMT as a form of therapy, ways in which participation in IMT improved their child's social interaction, and other areas of their child's behavior that were observed to be affected by IMT were analyzed for themes and frequency of responses.

Results

Twelve families indicated willingness to participate in the study and were mailed study packets. Of these twelve families, eight responded and seven completed and

returned survey packets for a total response rate of 66.7% and a questionnaire return response rate of 58.3%. One of the seven returned questionnaires was incomplete in that it did not contain information regarding social skills performance prior to and after participation in IMT but was still included in the study for demographic information and qualitative data analysis.

Participants

All children of the families who returned the study packets met inclusion criteria. Each questionnaire was answered by parents of children with an ASD. Of the seven returned questionnaires, four were from parents whose children were male, two from parents whose children were female, and one from a parent who did not identify the sex of their child. Four respondents reported having a child with a diagnosis of Asperger's Syndrome (AS) and three respondents reported having a child with an ASD. When asked to indicate by whom their child was given a diagnosis four respondents reported a psychologist, three respondents identified a pediatrician, one respondent a neurologist, and one respondent an Autism specialist (n = 7). Some respondents reported a diagnosis from more than one professional. Respondents also reported the type and duration of services received by each child prior to participating in IMT. Results are displayed in Table 1.

Participation in IMT

None of the children were enrolled in IMT sessions at the time of the study. The 00time span between termination of IMT services and completion of the survey ranged from 4 to 7 years with an average of 4.8 years (n = 7). The duration in which children participated in IMT ranged from 12 to 40 months with an average of 26.57 months (n =

7). Five children participated in IMT for consecutive months and two children participated in IMT for non-consecutive months. Themes derived from an open-ended question asking why parents decided to try IMT as a form of therapy for their child (n = 7) included (a) to increase body awareness, (b) to work on social skills, (c) help with regulation, and (d) looking for alternative methods of treatment. Goals respondents hoped to achieve by having their child participate in IMT included improved balance, strength, attention, self-calming, social skills, and language. The full range of responses to this question is summarized in Table 2.

Respondents were asked to report the frequencies in which their child attended IMT sessions and the frequency in which their child participated in group IMT sessions. Six children attended IMT sessions once a week and one child attended less than once a week. One respondent reported their child did not participate in group IMT sessions, two respondents reported sometimes participating in group sessions with 2-4 children in the group, one respondent reported often participating in group sessions with 3-4 children in the group, and three respondents reported always participating in group sessions with 3-4 children in the group. Six of the seven respondents completed the question pertaining to other services received simultaneous with participation in IMT. These responses are summarized in Table 3. Of these six respondents, five indicated that they received speech therapy an average of one hour per week. Two respondents indicated participating in social group therapy an average of 1.5 hours per week while participating in IMT. Respondents (n = 7) identified reasons for discontinuing IMT sessions as lack of funding (one respondent), schedule conflict (six respondents), and other (four respondents).

Reasons stated under "other" included participation in other activities, the IMT instructor leaving, and financial reasons.

Social Skills

The Likert score ratings for items addressing social skills were summed across subsections to acquire a total combined score for before IMT and after IMT. According to the data for social skills as a whole, $t(5) = 6.01$, $p = .007$ indicating that the after IMT scores were statistically significantly greater than the before IMT scores. After IMT score were statistically significantly greater than before IMT score for each of the four domains of social function measured. Results are summarized in Table 4. The overall social skills change score was obtained by subtracting the before IMT total score from the after IMT total score for each child and are presented in Table 5. Five children had a positive change in score and one child had a change of zero.

Outcomes

Five respondents reported that participation in IMT sessions improved their child's ability to interact socially. When asked to identify all of the areas of social interaction in which their child made the greatest improvement as a result of participating in IMT (n =6), five respondents identified maintaining interactions, four respondents identified responding to interactions, one respondent identified initiating interactions, two respondents identified affective understanding/perspective taking, and two respondents identified other areas. These areas included self-calming and "knowing how her body feels at different emotions." When asked to write in the ways in which their child's ability to interact socially improved, a variety of responses were given by respondents (n = 5). Such responses included "more comfortable, interactive and engaged in regards to

others," "able to maintain focus/conversation better," increased confidence, and "the ability to transfer social skills learned in class to daily interactions." Five respondents reported that areas other than social skills were also positively affected by IMT. These areas included the ability to self-calm and "control/modify flapping and other self stimulating behavior," "became more aware of her body/movement and how to maintain appropriate personal space," and "enjoyed the 'play' with the teacher part and the relaxation part at the end."

Discussion

The purpose of this study was to examine parent perception of the effect of IMT on social interaction in children with an ASD. The overall results of this study indicate that IMT generated a statistically significant positive change in the social skills of the group of children in this study ($n = 6$). This finding is not surprising when considering the ways in which an IMT session is structured for a child with an ASD. An IMT therapist works on social skills by modeling, coaching, explicit instruction, and utilizing the interactions that naturally arise during a session (S. Sisson, personal communication, April 4, 2011). For example, an IMT therapist may purposely set up a situation during a session that forces a child to ask for something he or she wants such as a yoga pose card (S. Sisson, personal communication, April 4th, 2011).

In addition to interacting socially with the IMT therapist, a majority of the children in this study (6 of 7 children) at least sometimes participated in group IMT sessions and three of these children always participated in group IMT sessions. The child who did not participate in any group IMT sessions was also the child with the least

amount of reported change in social skills scores after participation in IMT. However, this child was also reported to be non-verbal.

When examining the change in social skills scores for the three children who always attended group IMT sessions, no specific pattern was identified. One of these children had the greatest change score for overall social skills scores from before IMT to after IMT, whereas the other child had the fourth highest change score. The third child's respondent did not complete the social skills portion of the questionnaire. Thus, it is difficult to conclude whether always participating in group IMT sessions had a greater positive impact on social skills compared to often or sometimes participating in group IMT sessions. Regarding duration of participation in IMT, the child with the longest participation duration (40 months) also had the largest change score from before IMT to after IMT. The child with the shortest participation duration (12 months) had one of the smaller change scores, but there were two other children with equal or smaller change scores. While this pattern is interesting to note, especially for the child with the longest participation duration, one cannot form any significant conclusions regarding the relationship between duration of participation in IMT and effect on social skills.

It is interesting to note that the child who was reported to be non-verbal was also the child who had the lowest level of participation in IMT (less than once a week), did not participate in any group IMT sessions, and did not show any reported change in social skills scores after participation in IMT. This child's respondent reported that they did not believe that participation in IMT helped to improve their child's ability to interact socially. Given this pattern of limited services, it is not surprising that no changes were reported for this child. However, many of the social skills measured by the questions in

this study are biased towards children who are able to communicate verbally. Thus, using such a scale to measure social skills in a child who is non-verbal may not be the most appropriate. In addition, had the child received a greater number and more frequent services, greater gains in social skills may have been noted. Kenny (2002) claimed that yoga helps children achieve a calm state on their own rather than relying on someone else. The parent of this child reported that participation in IMT increased their child's ability to self-calm which is surprising given the decreased frequency of participation.

In addition to answering questions pertaining to social skills, parents were also asked to report any other areas of their child's behavior that they believed to be affected by participation in IMT. Two reoccurring themes were the ability to self-calm (40%) and increased body awareness (40%). These outcomes are in accordance with the six core principles of IMT which include self-calming and physical stimulation (Kenny, 2002) and with common IMT session aims of promoting body awareness (S. Sisson, personal communication, April 4, 2011) and self-calming activities.

Limitations

This study had a very small sample size and is based on a specific form of yoga therapy, therefore generalization of results is limited. Due to the nature of this study, outside variables such as participation in other therapy services and the duration of participation in IMT could not be controlled. While parent report has been used in other studies to examine the effects of a child-based intervention, parents in this study were asked to report on behaviors of their children from 4 to 7 years ago. Such a large gap in time may have affected accuracy of parent's recall especially regarding specific social skills. In addition, IMT is a service for which parents pay out of pocket. Thus, if a parent

did not feel that their child was making some kind of improvement, it is likely that they would discontinue IMT sessions prior to the three month participation duration inclusion criteria, and thus would not have been included in this study. As a result, data from parents who did not think that their child benefited from IMT in any way were not included in this study.

Implications for Occupational Therapy

Occupational therapy practitioners have academic and practical training in the importance of and strategies for building skills in social participation. While there are numerous occupational therapy interventions aimed at improving the social participation of children with an ASD, therapists continue to search for the best combination of intervention methods for each individual child. Results from this study suggest that participation in IMT contributed to an increase in social skills for the children in this study. Therefore, IMT should be considered as another type of intervention to incorporate into a child's treatment when social interaction is a concern. Occupational therapists working with children in a geographic location with an integrative movement therapist close by, can suggest participation in IMT as a complement to occupational therapy to address difficulties with social interaction. An occupational therapist can also become certified as an integrative movement therapist or enroll in a 13 hour IMT and children training course in order to incorporate aspects of IMT into their therapy sessions.

Future Research

This study reveals interesting trends both in the area of social skills as well as other aspects of behavior affected by IMT. Further research should control for simultaneous participation in other services and should be conducted concurrent with

participation in IMT. In order to better understand all of the ways in which IMT affects children with an ASD, an exploratory study should be conducted examining those performance areas that IMT claims to address. Due to the fact that integrative movement therapists are mainly located in the Pacific Northwest, conducting a study on the effects of yoga in general on social participation in children with an ASD would help to increase the generalizability of the study. Because there are a number of different intervention methods for occupational therapists to choose from when working with a child with an ASD, it would be interesting to examine if, and how, occupational therapists are currently using yoga in their treatment of children with this diagnosis.

Conclusions

Results of this study indicated that the after IMT social skills scores for all children in this study are statistically significantly greater than the before IMT scores. While the difference in scores is promising, it is impossible to state that IMT was the sole cause of this change. On the other hand, results suggest that participation in IMT did have a positive effect on social skills for the children in this study. In addition, IMT also appears to affect other areas of behavior including self-calming, increased body awareness, and enjoyment of play with others. Further research should investigate these other areas of behavior reported to be affected by IMT as well as the effects of yoga in general on social participation in children with an ASD. Occupational therapists can recommend IMT to clients when appropriate, or occupational therapists themselves can become certified integrative movement therapists and incorporate IMT into therapy sessions.

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Table 1

Services Received Prior to Participation in IMT (*N* = 5)

Service	# of Respondents	Duration (months)
Occupational Therapy	4	12-36
Speech Therapy	5	12-96
Physical Therapy	0	0
Group Therapy (social)	1	24
Other[a]	3	24-36

[a] Horse Therapy, Counseling and Home Therapy, or Relationship Development Intervention (RDI)

Table 2
Goals Hoped to Achieve from Participation in IMT (*N* = 7)

Goal	# of Respondents
Improve Balance	3
Improve Strength	2
Improve Attention	4
Improve Self-Calming	6
Improve Social Skills	6
Improve Language	2
Other[a]	1

[a]Learn to follow directions

Table 3
Services Received While Participating in IMT (*N* = 6)

Service	# of Respondents	Duration (hours per week)
Occupational Therapy	3	1
Speech Therapy	6	1
Physical Therapy	0	0
Group Therapy (social)	2	1-3
Other[a]	2	0.75-3

[a]Tutor, Counseling

Table 4
Difference of Children's Social Skills Score Before IMT and After IMT ($N = 5$)

Social Skill	Mean Before IMT	Mean After IMT	*t*	*p*
Maintaining Interactions	8.667	12.417	6.01	.007*
Responding to Initiations	6.667	10.333	3.50	.018*
Initiating Interaction	11	15.667	3.97	.011*
Affective Understanding/Perspective Taking	17.333	23.5	3.43	.019*

Note. Questions on survey were taken from Stone, W., Ruble, L., Coonrod, E., Hepburn, S., Pennington, M., Burnette, C., Brigham, N. B. (2010). *TRIAD Social Skills Assessment manual*. Nashville, TN: Treatment and Research Institute for Autism Spectrum Disorders.

Table 5
Change in Total Social Skills Scores Per Respondent (*N* = 5)

Respondent	Change Score (after IMT-before IMT)
# 1	26.5
#2	16
#3	0
#4	24
#5	27
#7	16

Appendix A

Parents Perception of the Effects of Integrative Movement Therapy on Social Interaction in Children with an Autism Spectrum Disorder

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Please return your completed questionnaire in the enclosed self-addressed envelope

Please read each question carefully and answer as honestly as possible.

Demographic Information

We would like to know some basic information about your child

1) What is the sex of your child:
   MALE **FEMALE** (please circle)

2) What was your child's age when he/she began IMT sessions? _____

3) What was your child's age when he/she stopped IMT sessions? _____

4) What is your child's current age? _____

5) What is your child's diagnosis? _____

6) By whom was your child given this diagnosis? (please check one)
   - ☐ Family doctor
   - ☐ Pediatrician
   - ☐ Neurologist
   - ☐ Psychologist
   - ☐ Other:_____

Questions Pertaining to Participation in IMT

We would like to know more about your child's participation in IMT sessions.

7) Please briefly explain why you decided to try IMT as a form of therapy for your child? _____

_____

_____

_____

_____

7a)What goals did you hope to achieve by having your child participate in IMT sessions? (please check all that apply)

- ☐ To improve balance
- ☐ To improve strength
- ☐ To improve attention
- ☐ To improve self calming
- ☐ To improve social skills
- ☐ To improve language
- ☐ Other (specify_____)

8) How long (in months) did your child participate in IMT sessions? _____months

8a. Were they consecutive months? **Y** **N** (please circle one)

9) When your child was participating in IMT sessions, how often did he/she attend? (please check one)

- ☐ < 1x week
- ☐ 1 x week
- ☐ 2 x week
- ☐ 3x week
- ☐ > 4 x week
- ☐ my child only attended one session total

10) Please check the box that indicates the frequency that your child participated in group IMT sessions? (please check one)
If your child participated in group IMT, please write in the average number of children present during the group session.

- ☐ None
- ☐ Sometimes _____ children in the group
- ☐ Often _____ children in the group
- ☐ Always _____ children in the group

11) Did your child receive any other services (including those provided by your child's school) while participating in IMT? (please check all that apply)
If your child received other services, please write in the number of hours per week that your child attended each type of therapy.

- ☐ Occupational therapy _____ hours per week
- ☐ Speech therapy _____ hours per week
- ☐ Physical therapy _____ hours per week
- ☐ Group therapy (type_____) _____ hours per week
- ☐ Other (specify_____) _____ hours per week

12) Did your child receive any other services before participating in IMT? (please check all that apply)
For each therapy checked, please indicate the length of time your child was receiving the specific therapy in years and/or months.

Years/months

- ☐ Occupational therapy _____
- ☐ Speech therapy _____
- ☐ Physical therapy _____
- ☐ Group therapy(specify_____) _____
- ☐ Other (specify_____) _____
- ☐ Other (specify_____) _____
- ☐ Other (specify_____) _____

13) What were your reasons for discontinuing IMT sessions? (please check all that apply)

- ☐ My child's goals were met
- ☐ Lack of funding
- ☐ Schedule conflict
- ☐ My child was discharged by his/her IMT therapist
- ☐ Other (please describe)

_____

_____

_____

Questions Pertaining to Social Skills

We would like to know about your child's social skills and abilities before and after participation in IMT. Answer each item by reporting your child's abilities immediately prior to beginning IMT and at the time your child discontinued IMT sessions.

*A majority of the questions comprising the following sections; sections 1, 2, 3, and 4 were taken from the TRIAD Social Skills Assessment (TSSA, Stone, Ruble, Coonrod, Hepburn, Pennington, Burnette, & Brigham, 2010) with permission from the author.

Section 1: Maintaining Interactions

Please use the following scale to indicate how well your child did each of the following:

1	2	3	4
Not very well	Somewhat	Moderately well	Very well

How well did your child…	**BEFORE** IMT	**AFTER** IMT
Play cooperatively with other children (e.g., sharing, taking turns, following rules)?	1 2 3 4	1 2 3 4
Stay on topic during conversations?	1 2 3 4	1 2 3 4
Maintain eye contact with others during interactions?	1 2 3 4	1 2 3 4
Speak in an appropriate tone of voice during interactions (e.g., not too loud, soft, mechanical, or sing-songy)?	1 2 3 4	1 2 3 4
Respect the personal space of others during interactions (i.e., not stand too close or too far away)?	1 2 3 4	1 2 3 4

Section 2: Responding to Initiations

Please use the following scale to indicate how well your child did each of the following…

1	2	3	4
Not very well	Somewhat	Moderately well	Very well

How well did your child…	**BEFORE** IMT	**AFTER** IMT
Respond in a friendly manner when he/she is greeted by others?	1 2 3 4	1 2 3 4
Respond in a friendly manner when others invite him/her to play?	1 2 3 4	1 2 3 4
Respond in a friendly manner to questions or requests from others?	1 2 3 4	1 2 3 4
Respond in a friendly manner when others try to start conversations with him/her?	1 2 3 4	1 2 3 4

Section 3: Initiating Interaction

Please use the following scale to indicate how well your child did each of the following…

1	2	3	4
Not very well	Somewhat	Moderately well	Very well

How well did your child…	**BEFORE** IMT	**AFTER** IMT
Initiate greetings to familiar people on his/her own?	1 2 3 4	1 2 3 4
Invite others to play with him/her?	1 2 3 4	1 2 3 4
Join a group of children who are already playing?	1 2 3 4	1 2 3 4
Ask others in a direct manner for something he/she wants?	1 2 3 4	1 2 3 4
Ask others for help when he/she needs it?	1 2 3 4	1 2 3 4
Start conversations with others?	1 2 3 4	1 2 3 4

Section 4: Affective Understanding/Perspective Taking

Please use the following scale to indicate how well your child did each of the following…

1	2	3	4
Not very well	Somewhat	Moderately well	Very well

How well did your child…	**BEFORE** IMT	**AFTER** IMT
Understand what other people's facial expressions mean?	1 2 3 4	1 2 3 4
Understand what other people's "body language" means?	1 2 3 4	1 2 3 4
Use a wide range of conventional facial expressions to express his/her feelings (for example, raised eye brows to express surprise; a scowl to express anger)?	1 2 3 4	1 2 3 4
Use a wide range of gestures or "body language" to communicate (for example, use an "OK" hand sign; cross arms when angry)?	1 2 3 4	1 2 3 4
Understand that other people can have thoughts and feelings that are different from his/her own?	1 2 3 4	1 2 3 4
Understand other people's perspectives in a variety of situations (i.e., put himself/herself "in another person's shoes")?	1 2 3 4	1 2 3 4
Understand what makes other people feel basic emotions such as happiness, sadness, or fear?	1 2 3 4	1 2 3 4
Understand what makes other people feel complex emotions such as surprise, guilt, or embarrassment?	1 2 3 4	1 2 3 4
Understand the meaning of basic emotions (for example, did they understand what it meant to be happy, sad, angry etc.)	1 2 3 4	1 2 3 4

Section 5: Outcomes

1) Overall do you believe participation in IMT sessions improved your child's ability to interact socially? **Y** **N** (please circle)
If **YES**, please explain how your child's ability to interact socially has improved_____

_____

_____

_____

_____

2) In what areas of social interaction do you feel your child made the greatest improvement as a result of participating in IMT sessions? (please check all that apply)

- ☐ Maintaining interactions
- ☐ Responding to interactions
- ☐ Initiating interactions
- ☐ Affective Understanding/Perspective taking
- ☐ Other (specify_____)

3) Are there any other areas of your child's behavior (aside from social skills) that you believe were affected by IMT?
Y **N** (please circle)
If **YES** please list the affected areas of behavior and briefly state how they were affected_____

_____

_____

_____

_____

_____

_____

_____

_____

Appendix B

March, 2011

Dear Parent,

As the parent of a child diagnosed with an autism spectrum disorder (ASD) who has participated in Integrative Movement Therapy (IMT) sessions, you are being invited to participate in a research project. This research project is designed to determine your perception of the effects of IMT on your child's social interaction abilities. Enclosed is a questionnaire with questions about your child's participation in Integrative Movement Therapy and his/her social skills. This research is part of my Master's degree thesis at the University of Puget Sound School of Occupational Therapy.

You have been asked to participate in this survey because you are the expert regarding your child and his/her behavior in every day life. It is anticipated that this questionnaire will take no more than 20 minutes to complete. Your consent to participate in this research is implied by your returning the completed survey. Please return it simply by placing the completed questionnaire in the postage-paid envelope provided within 10 days of receiving it. You may be assured that your confidentiality will be protected. Neither your name nor any other personally identifying information are recorded on the survey. The Samarya Center will maintain the mailing list with addresses of all participants and will address all questionnaire packets. As a result, the researcher will never see or receive a record of the names and addresses of packet recipients. The study is considered to be of minimal risk, as the anticipated risk is no greater than those encountered in daily life. Your participation or decision not to participate in this study is completely voluntary and will in no way impact your relationship with the Samarya Center.

The results of this survey will be presented at a research symposium in May 2011 at the University of Puget Sound and the thesis will later be available at the University library. If you have any questions about this research, feel free to call me at 253-473-8562, or e-mail me at jbonilla@pugetsound.edu.

Thank you for your time and consideration in contributing to this research.

Sincerely,

_____

Juliana Bonilla, Occupational Therapy Student

_____

Renee Watling, PhD, OTR/L
Research Project Advisor
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