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The Effect of Yoga and Breathing Exercises on Children with Autism

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Honors Research Project:

The Effect of Yoga and Breathing Exercises on Children with Autism

Leah Brausch

The University of Akron

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Abstract

The purpose of this case study was to determine the effects of yoga and breathing exercises on children with Autism Spectrum Disorder (ASD). Common characteristics of children with ASD were noted and observed throughout the study in order to determine effectiveness of the therapy at hand. Yoga therapy was implemented for nine (9) weeks through an at-home program. It was determined that, while long-term effects were not evident, there is reasonable evidence to implement yoga therapy to assist with focus and attention. This paper

serves to review characteristics of children with ASD, typical therapies used to assist them and the effectiveness of yoga and breathing therapies. This research can assist professionals and parents of children with ASD to determine what non-traditional therapies may be useful for their child, as well as serve as a platform for further research into yoga and breathing therapies.

Introduction

Autism Spectrum Disorder is a disorder that affects nearly 1% of the population world wide (American Psychiatric Association 2013). Diagnosis criteria includes persistent deficits in social communication and interactions as well as restricted, repetitive patterns of behavior, interests or activities (American Psychiatric Association 2013). These symptoms are present at a very young age and cause significant impairment in daily living (American Psychiatric Association 2013).

In the past two decades, the prevalence of ASD in the United States has risen from 1 in 88 children to 1 in 68 children (Wright 2017). Although many studies have been completed about the efficacy of treatments for children and adults with Autism, there is still much to be done. Past research of treatments has focused much on providing tools that make it possible for an individual to cope with external factors. Children with Autism tend to better prosper in highly predictable and organized environments. However, this is not always possible. It would be useful for a child with ASD to have the tools necessary to soothe oneself when their sense of normal is upset. This research focuses on the use of yoga and breathing exercises as a tool for children with ASD to utilize.

Literature Review

Autism Spectrum Disorder

Autism Spectrum Disorder is a disorder that affects approximately 1% of the population world wide (American Psychiatric Association 2013). It is a disorder that can typically be identified before the age of three due to its manifestation in distinct symptoms (Ehleringer 2010; Narasingharao, Pradhan, Navaneethan 2017). Children and adults with ASD display many similar characteristics. Individuals with ASD often display persistent deficits in social communication and social interaction across multiple contexts. This can include deficits in social-emotional reciprocity, nonverbal communication used for social interaction as well as deficits in developing, maintaining and understanding relationships (American Psychiatric Association 2013). Another common characteristic is that of restricted, repetitive patterns of behavior, interests or activities such as stereotyped or repetitive motor movements, insistence on sameness, highly restricted or fixated interests, and hypo- or hyperactivity to sensory input (American Psychiatric Association 2013). Together, symptoms cause clinically significant impairment in social, occupational or other important areas of functioning (American Psychiatric Association 2013). ASD is a spectrum as many individuals with ASD have many of the same characteristics, but at differing levels of severity (Ehleringer 2010). It is important to note this fact and realize that individuals may display certain characteristics at very severe levels or not at all. Each child is to be treated as a separate individual.

Traditional Therapies Used for Autism Spectrum Disorder

In the past, many different therapies and practices have been used to improve the quality of life for individuals with ASD. Individuals with ASD often work with professionals from several different fields such as occupational therapy, physical therapy, psychology and speech-language pathology. Each field brings a unique set of ideas and therapies with the potential of

benefiting their clients. One such intervention was that of Early and Intensive Behavioral Intervention (EIBI). This therapy was carried out in a very precise and structured environment tailored to the child (Luiselli 2014). This therapy is implemented with the hope of increasing intellect and adaptive functioning while decreasing unwanted behaviors (Luiselli 2014). Supports are gradually reduced until they are eventually unneeded by the child (Luiselli 2014).

Another highly researched technique was that of Computed-Based Instruction/Alternative Augmented Communication (AAC) which has been used more and more by a variety of professionals working with children and adults with ASD. Devices are used to augment learning for educational/communicational purposes (Luiselli 2014). These technologies are often useful to teach new knowledge/behaviors, for drill and practice, for stimulation (auditory, visual, vibratory), to evaluate performance and to complement teacher-based instruction (Luiselli 2014).

Video Modeling can also be used as a form of teaching. In video modeling, a social situation is often portrayed and the individual with ASD is able to learn what constitutes typical social behaviors. In addition to the aforementioned therapies, many other therapies are used to supplement the learning of individuals with ASD. Social Stories, as in video modeling, demonstrate what is considered socially acceptable in certain situations. These may include stories about daily greetings, encounters at the grocery store or how to resolve a problem. The individual can then practically apply this knowledge to real life situations. Many other naturalistic approaches such as these exist to supplement and augment the lives of individuals with Autism (Luiselli 2014). Examples of such therapies can also include peer tutoring, training groups and social problem solving.

All of the aforementioned therapies were research-based and commonly used in a variety of settings. The study at hand attempted to forge a new type of therapy that included the use of yoga therapy. The premise of this study is that yoga allows for children with ASD to harmonize sensory integration of the mind and body and physical movement—all of which are often perceived as challenges by those with ASD. The question at hand is then, if made more aware of themselves through the power of yoga, can individuals with ASD become more aware of others.

Yoga and Yoga Therapies

Yoga is a practice that began in India around 3000 BC (Field 2009). There are a variety of types of yoga practices. The most common is that which combines a rhythm of the breath with stretching and exercise positions (Field 2009). Yoga has proven effective for the general population in many different aspects. In general terms, “Yoga is noncompetitive and provides an environment where risk-taking and self-confidence can increase” (Radhakrishna, Nagarathna & Nagendra 2010, p. 121). For many, yoga is a life-long practice (Radhakrishna, Nagarathna & Nagendra 2010). It has been shown that yoga has the ability to increase flexibility, exercise and sports performance, as well as weight loss (Field 2009).

Previously, yoga therapy was implemented in varying populations. In the case of individuals with mental health disorders, yoga has been shown effective for individuals with both anxiety and depression (Field 2009; Michalsen, Grossman, Acil, et. al, 2005). In a three-month yoga program, women showed drastic decrease in perceived stress (Michalsen, Grossman, Acil, et. al, 2005). Yoga has also been proven effective for individuals with medical disorders such as pain, migraines/headaches, insomnia, cancer, high blood pressure and arthritis (Field 2009). In one study of individuals experiencing headaches, participants noticed a significantly lower

frequency and intensity of headaches after three months of yoga therapy (John, Sharma, Sharma, & Kankane 2007). In a separate study, breast cancer patients experienced a reduction of pain and fatigue and an increase in their levels of relaxation after completing a full year of yoga therapy (Carson, Carson, Porter, et. al. 2007).

The Use of Yoga Therapies for Children with Autism Spectrum Disorder

As defined by Sarah Hourston (2017) in her research article on using mind-body therapies for individuals with ASD, yoga is “a movement-based therapy that incorporates physical poses and attention to breath” (Hourston 2017, p. 331) As stated previously, many individuals “with ASD experience co-occurring conditions such as depression, anxiety and high stress levels, for which mind-body therapies may be most beneficial” (Hourston 2017, p. 331). It then follows to reason that yoga may prove to have multi-faceted benefits for individuals both with their symptoms of ASD and to any co-occurring conditions that may be present. In fact, previous research has found that “Mind-Body therapies or techniques are used by up to 30% of people with an autism spectrum disorder” (Hourston 2017, p. 331). It is, however, important to note that yoga therapies should be implemented only alongside other therapies already proven to help individuals with ASD.

Previous studies have addressed many different aspects of ASD and the possible benefits of using yoga as a part of therapy (Deorari, Bhardqaj, 2014; Ehleringer 2010; Koenig, Buckley-Reen, Garg, 2012; Narasingharao, Pradhan, Navaneethan, 2017; Radhakrishna, Nagarathna, Nagendra, 2010; Rosenblatt, Gorantla, Torres, et. al. 2011). For example, several studies found improvements in the ability to interact with other children and family members (Radhakrishna, Nagarathna & Nagendra 2010). This is an important finding as many children and adults with

Autism struggle in forming meaningful social connections. Studies involving yoga also found improvements in eye contact among children with ASD (Deorari, Bhardqaj, 2014; Ehleringer 2010; Narasingharao, Pradhan, Navaneethan, 2017; Radhakrishna, Nagarathna, Nagendra, 2010). An improvement of body awareness, co-ordination and sensory integration was also found in many studies (Deorari, Bhardqaj, 2014; Ehleringer 2010; Koenig, Buckley-Reen, Garg, 2012; Radhakrishna, Nagarathna, Nagendra, 2010; Rosenblatt, Gorantla, Torres, et. al. 2011). A study done by Ehleringer (2010) found that when yoga therapy was implemented, children with ASD experienced an increased ability to self-regulate stress levels. Other studies found that children with ASD had generally better behavior including the ability to sit for long periods of time (Deorari, Bhardqaj, 2014; Hwang, Kearney, Klieve, et. al 2015; Narasingharao, Pradhan, Navaneethan, 2017; Rosenblatt, Gorantla, Torres, et. al. 2011). Finally, it was found that yoga allowed children with ASD to shift attention to themselves (Deorari, Bhardqaj 2014). This allows for the child to focus on internal factors which can be regulated more easily than external elements that are less easily manipulated. In this way, it was found that children were better able to self-regulate and cope with change (Deorari, Bhardqaj 2014).

In the aforementioned studies highlighting the benefits of yoga, studies included blocks of time dedicated to yoga rather than an interspersal in typical school or therapy activities (Deorari, Bhardqaj, 2014; Ehleringer 2010; Koenig, Buckley-Reen, Garg, 2012; Narasingharao, Pradhan, Navaneethan, 2017; Radhakrishna, Nagarathna, Nagendra, 2010; Rosenblatt, Gorantla, Torres, et. al. 2011). The project at hand aimed at determining the effectiveness of yoga and yoga therapy when interspersed throughout the day. This approach was taken as it was hypothesized that this type of implementation more accurately reflects what natural self-regulation may look

like for a child with ASD. In contrast to the aforementioned studies, in this study the child was given instructions through a one-on-one format. This was implemented with the aim that the researcher could better guide the child and tailor the therapy to fit his needs. The intent of this study was to more specifically determine benefits of yoga for children with ASD.

Methods

The project included one participant, age 11, and was conducted at the child's home. The University of Akron's Institutional Review Board (IRB) granted approval for this study. Parents were provided with an informed consent form that educated them of the intentions of the study as well as details about the researcher and project. The child chosen as the participant was also given an assent form describing the investigation, what to expect, and details about the researcher.

During the initial stages of the investigation, the researcher initiated conversations with the mother of the participant in order to inform her of the research project as well as gain further background information regarding her son. The mother also identified areas of weakness that could potentially be addressed during the investigation. Based on this information, and other information gathered, the researcher designed a yoga therapy plan tailored specifically to the participant.

The participant of this project was an 11-year old male who was diagnosed with ASD at age three and has since worked with many professionals in order to best live with this diagnosis. He meets with both a Speech Pathologist and Occupational Therapist once a week. Additionally, his parents decided to homeschool as they believe it provides the best educational option for him. In addition to his homeschooling, his two younger siblings are also taught at home under the

direction of their mother. The participant had many strengths and weaknesses. His mother pointed out particular weaknesses that she desired for the investigator to focus on during the implementation of the yoga therapy. She asked that coordination/balance, attention and muscle tone, specifically between the shoulder blades, be addressed.

Prior to starting the investigation, the mother of the participant received a packet of information. This packet included the Informed Consent Form (Appendix A) as well as a survey striving to gain pertinent information about the participant (Appendix B). Also included was a child assent form (Appendix C) for the participant. The researcher distributed the materials to the participant and his mother. All forms were completed and returned prior to the investigation.

The survey instrument included three distinct parts. Part one was titled “General Information.” Questions were presented in a fill-in-the-blank format and collected background information on the child such as age and grade. Part two was titled “Therapy/Educational Background.” This section also implemented a fill-in-the-blank, as well as, a yes/no format to collect data regarding the child’s educational and clinical history. Questions targeted information such as amount of time spent in therapy and previous therapy techniques used.

The third and final part was titled “Abilities and Behaviors” and was broken down in to four separate sections. Responses were given as a rankings from one (1) to seven (7). A response of one (1) indicated that the statement was rarely or never true regarding the participant’s abilities/behaviors, while a response of (7) indicated that the statement was always or almost always true regarding the participant’s abilities/behaviors. The first section addressed social and behavioral habits such as the usage of eye contact, habits in regards to maintaining conversations, as well as questions addressing other pertinent social skills. The second section

focused on attention and the participant's ability to attend to speakers and tasks at hand. The third section focused on the child's physical abilities and strength. The final section was reserved for other, miscellaneous information regarding digestive health.

Following data collection, implementation of the yoga therapy plan commenced. The investigator implemented the new therapy techniques during her usual scheduled time with the client and his family. Therapy was implemented every Monday from January 15, 2018 until March 19, 2018, or a total of nine (9) sessions. The researcher works with the participant and the participants's sister for a total of four hours every Monday from 9:00am until 1:00pm. As the children are homeschooled, this is considered their typical school day. Along with the investigator, the children also meet with another at-home tutors two other days for schooling during the week. A typical school day runs as follows:

1. 9:00am-9:15am Start of Day
2. 9:15am-10:30am Handwriting and Reading
3. 10:30am-11:15am Science
4. 11:15am-12:00pm Math
5. 12:00pm-12:15pm Exercise
6. 12:15pm-12:30pm Snack
7. 12:30pm-1:00pm Social Skills

For the investigation, yoga was implemented during Start of Day and interspersed between subjects to act as a mental and sensory break.

Table 1: Yoga Therapies Used Throughout Instruction

Downward Dog	When Implemented: Start of Day Purpose: This is a full-body pose that allows for participants to become aware of their bodies which could help with focus.
Child's Pose	When Implemented: Start of Day Purpose: Bring calm to the body, enhance the breath
Cobra	When Implemented: Start of Day Purpose: Stretch abdominal muscles.
Cat/Cow	When Implemented: Start of Day and between classes Purpose: A dynamic pose that syncs the breath with movements
Rag Doll	When Implemented: Start of Day and between classes Purpose: Stretch the hamstrings and back.
Plank	When Implemented: Start of Day and between classes Purpose: Strengthen abdominal and shoulder muscles, allows for release of extra energy.
Tree	When Implemented: Start of Day and between classes Purpose: Enhance balance and bring awareness to the body, allowing for refocus
Airplane	When Implemented: Start of Day and between classes Purpose: Enhance overall balance as well as muscle tone between the shoulder blades.
Warrior I	When Implemented: Start of Day and between classes Purpose: Enhance coordination, allows for energy release.

It is important to note that breathing is inherently a part of yoga and that during this entire study, particular interest was given to the breath. It is also important to note that the researcher was very particular about the poses. It was vital that the child successfully complete each pose with the proper form and breath.

Sun Salutations were performed during Start of Day for an average of 5 minutes. During the rest of the school day, poses were completed between classes for about 3 minutes each. This added up to a total of about 20 minutes of yoga each day.

At the end of the research period, the survey was re-distributed to the mother.

Additionally, the mother and child were interviewed by the researcher in order to gain insight on

their experiences and feedback as to how the therapy went. Their results were recorded and are discussed in the next section.

Results/Discussion

When the implementation of yoga therapy was completed, the survey was re-distributed to the mother. Additionally, the mother, child and researcher discussed the results. The results are presented in the tables below. Discussion of the results follow each table.

Table 2: Behavior/Social Habits

	Difference in Pre/Post Test
Your child is able to socially interact with other children his age.	No Change.
Your child is able to socially interact with adults.	No Change.
Your child is able to maintain eye contact with others during conversation	No Change.
Your child is able to stay on subject of a given conversation	No Change.
Your child understands personal space and how much space is appropriate for different social interactions such as conversations with family, friends and teachers	No Change.
Your child demonstrates high self-esteem	No Change.
Your child experiences stress when in large groups of people	No Change.
Your child experiences stress when in a novel social situation	No Change.
Your child displays specific interests and has difficulty talking about other subjects	No Change.
Your child experiences strong reactions to changes in routine/environment	No Change.

Based on the subjective results of the survey, no observable change was found. However, after the survey was completed, all results were discussed with the participant and his mother. Both the mother and child observed that there was no difference in the pre/post test results.

Different factors were discussed that may play a factor into these results. The mother suggested that yoga may not, in-fact, be the most efficacious way to improve on these qualities as yoga is not a socially-based practice. The researcher noted that group yoga therapy may offer additional advantages in this area. It was also discussed that a longer study may provide more insight into the effects of yoga on social/behavioral habits. It was additionally stated that yoga therapy may prove to be beneficial in this area if practiced outside of school. For example, if the child had continued with a yoga routine that was implemented each night at home or with his other therapist, benefits could have increase. Implementation more than once a week could have served to allow for more carry-over in terms of social/behavioral traits.

Table 3: Attention

	Difference in Pre/Post Test
Your child tends to become distracted easily	No Change.
Your child can easily focus on one task for a significant length of time	No Change.
Your child often thinks about other things when he/she should be focused on something else	No Change.

Although the subjective results displayed no change, discussion with the mother and participant yielded varying results. Both the mother and child agreed that the yoga routine did help during the school day to maintain focus. For example, the child explained that when yoga was used between classes, it helped him get rid of his “jitters” and become more attentive/focused. He continued that sometimes he gets distracted during class and needs a break to become re-centered. The yoga gave him the opportunity to do so and remain engaged in his academic work. The mother affirmed that she also noticed this. She felt as though the interspersal of yoga allowed the participant to become refocused on his academics. It was again indicated

that different variables such as a longer study, yoga at longer intervals or an at-home program could prove to be efficacious in carry-over. Perhaps if any of these factors were changed, the participant would have the ability to be more attentive in varying environments.

Table 4: Physical Appearance

	Difference in Pre/Post Test
Your child has muscle tone consistent with his/her age	No Change.
Your child maintains good posture	No Change.
Your child displays adequate strength for his/her age	No Change.

As with the other two sections, results of this section were discussed with the mother and participant. Many of the same comments arose as discussed earlier. Although there was no evidence of change in terms of physical appearance, there is still potential for yoga to be beneficial in physical fitness aspects. The child noted that the poses became easier for him as the research progressed. At the beginning of the study, many of the poses were challenging for him as he has difficulty with balance and coordination. He attested that the poses got easier over time and he felt as though he did gain strength. However, this did not result in objective, visible change on the part of his mother. As previously discussed, it was again mentioned that a more intense, different schedule, or longer study could yield different results in this aspect. As with any physical fitness routine, it takes time for measurable, objective, change to become apparent.

Further Research

Previous research has shown the over-arching positive effects of yoga therapy for children with ASD. However, no studies have shown how specific yoga routines may affect the child in differing manners. For example, one type of therapy may be more efficacious for a child

more strongly displaying certain characteristics of ASD than others. It would be interesting to research the effectiveness of therapy techniques between participant groups. The same thing could also be said for the length of the yoga involved. It's possible that implementing yoga for differing lengths of time and at varying schedules may impact children with ASD differently.

Additionally, in previous research, only the child with Autism was instructed in yoga. There is potential for more benefit if both the child and his/her parent/caregiver learn yoga. In this way, perhaps, it would be more likely that yoga is practiced outside of the therapy or school setting. Additionally, the parent may reap many benefits as well. Often, parents/caregivers of children with Autism feel much stress due to the heightened needs of their child. It could be beneficial for the parents to also experience relief from this daily exposure to stress.

Lastly, another subject of research could be the implication of yoga therapy in general education classrooms. Children with Autism often have several classes with other typically developing children. If yoga is implemented in the classroom, there is a possibility that all students would reap the benefit. It would be interesting to note how yoga benefited both groups involved, as well as, the class as a whole.

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Appendix A

The Effect of Yoga and Breathing Exercises on Children with Autism

INFORMED CONSENT

Introduction: You are being invited to participate in a study pertaining to the use of yoga and breathing exercises on a child with Autism. The study will be conducted by undergraduate student Leah Brausch, under the advising of Dr. Scott Palasik this spring in the Department of Speech-Language Pathology and Audiology at The University of Akron. The goal of the study is to explore the relationships between yoga and its effectiveness for children with Autism. The study focuses on the improvement of attention, behavior, speech and language, social skills, sensory input and muscle tone during the implementation of yoga therapy.

Participants: A parent or guardian of a child who has Autism.

Exclusionary Criteria: Parents who do not have children that have Autism will not be able to participate.

Procedures: This study will involve filling out a questionnaire at home and returning the questionnaire in the provided self-addressed envelope to Dr. Palasik. The participant will then participate in a six-week yoga program to supplement his traditional schoolwork and therapy. The questionnaire will be completed again at the end of the six week period to determine results. **If you choose to participate, please sign this form below and return it in the envelope with the completed questionnaire.**

The questionnaire asks questions about your child including their current habits and behaviors, interests, as well as basic questions about your family.

The questionnaire should take no more than 10-15 minutes.

Contact: For any questions or concerns regarding this questionnaire, please e-mail Scott Palasik at: spalasik@uakron.edu or Leah Brausch at: ljb68@zips.uakron.edu

Risks and Benefits: There is minimal anticipated risks to this study. The child will be guided by researcher 100% of the time while participating in yoga activities.

Payment / Costs: Participation in this study is voluntary; there will be no financial payment for participating.

Confidentiality: Your personal information will be kept confidential. Results will be reported, but your child's name and identifying information will not be collected. No identifying information, other than your name on the consent form, will be collected. The consent form will be kept separate from the survey, to insure your anonymity.

Questions: If you have any more questions you can contact **Scott Palasik** at 330-972-8185 (spalasuk@uakron.edu). This project has been reviewed and approved by The University of Akron Institutional Review Board. If you have any questions about your rights as a research participant, you may call the IRB at (330) 972-7666.

Consent: I understand that this study is being conducted for the purpose of undergraduate research at the University of Akron. Through this document the researcher has explained how the study will be completed, what I will have to do, and how long my participation is required. I am aware that my full participation in this study is voluntary. I am fully aware that identifying information of myself, my child, or other family members will not be released or used in any manner. I am aware that no compensation will be provided for completing this questionnaire. By signing this form I consent my participation in the study and will fill out the questionnaire to the best of my ability.

Participant Signature (Consent to Participate)

Date

Appendix B

1. General Info

Child Name: _____

Age of Child: _____

Gender of Child:_____

Grade in School:_____

Child's Favorite Activities:_____

2. Therapy/Educational Background

1. At what age did your child begin attending Speech-Language Therapy?

_____years _____month(s)

2. What was the setting of the Speech Therapy? (e.g. hospital, clinic, school, etc.)

3. Does your child continue to attend Speech Therapy? (Circle One)

Yes No

a. If yes, how frequently? _____

4. Does your child attend any other types of therapy sessions on a continual basis? (Circle One)

Yes No

a. If yes, what kind(s)_____

5. In any of your child's therapy session has any type of yoga or breathing therapy been implemented? (Circle One)

Yes No

a. If yes, please describe: _____

3. Abilities and Behaviors

Answer the following questions to the best of your ability about your child's habits/behaviors by circling a number from 1-7. A score of (1) indicates that the statement is rarely or never true while a score of (7) indicates that the statement is almost always or always true.

Section A: Behavior/Social Habits

1. Your child is able to socially interact with other children his age.

1 2 3 4 5 6 7

2. Your child is able to socially interact with adults.

1 2 3 4 5 6 7

3. Your child is able to maintain eye contact with others during conversation.

1 2 3 4 5 6 7

4. Your child is able to stay on subject of a given conversation.

1 2 3 4 5 6 7

5. Your child understands personal space and how much space is appropriate for different social interactions such as conversations with family, friends, and teachers

1 2 3 4 5 6 7

6. Your child demonstrates high self-esteem.

1 2 3 4 5 6 7

7. Your child experiences stress when in large groups of people.

1 2 3 4 5 6 7

8. Your child experiences stress when in a novel social situation.

1 2 3 4 5 6 7

9. Your child displays specific interests and has difficulty talking about other subjects.

1 2 3 4 5 6 7

10. Your child experiences strong reactions to changes in routine/ environment.

1 2 3 4 5 6 7

Section B: Attention

1. Your child tends to become distracted easily.

1 2 3 4 5 6 7

2. Your child can easily focus on one task for a significant length of time.

1 2 3 4 5 6 7

3. Your child often thinks about other things when he/she should be focused on something else.

1 2 3 4 5 6 7

Section C: Physical Appearance

1. Your child has muscle tone consistent with his/her age.

1 2 3 4 5 6 7

2. Your child maintains good posture.

1 2 3 4 5 6 7

3. Your child displays adequate strength for his/her age.

1 2 3 4 5 6 7

Section D: Other

Please answer each question to the best of your ability about your child.

Does your child complain of stomach pain or discomfort? (Circle One)

Yes

No

Is your child on a special diet? (Circle One)

Yes

No

If yes, please explain (what type of diet, why was it implemented? Does it seem to help?): _____

**Adapted from Sonia Sumar, Autism Behavior Checklist

Appendix C

Child Assent

The Effectiveness of Yoga and Breathing Exercises on Children with Yoga

My name is Leah Brausch and I am an at-home tutor at LLA Therapy and an undergraduate student at the University of Akron.

I am asking you to take part in a research study because I am trying to learn more about the effectiveness of yoga and breathing exercises on children with Autism. I hope that what I learn from this study will be able to help other kids with Autism to cope with their disorder and provide them with new techniques to use in novel situations.

If you agree to this study, we will incorporate yoga into our daily school routine. We will practice yoga and breathing techniques to see if it helps in many aspects of our day. It could help with your attention and ability to retain information, as well as stay engaged. Throughout this study, you may learn new techniques that you can use everyday if you start to feel frustrated or overwhelmed.

Following this study, my hope is that you will be equipped with tools that can be used in the future in many different environments such as home, therapy and church.

If you don't want to be in this study, you don't have to participate. Remember, being in this study is up to you and no one will be upset if you don't want to participate, or even if you change your mind later and want to stop. Your parents must also give their consent for your participation, but even if they consent, you can say no.

You can ask any questions that you have about the study. If you have a question later that you didn't think of now, you can make sure it is ok with your parents and then call me at (937) 725-6037, or ask me the next time you see me.

Signing your name at the bottom means that you agree to be in this study. You will be given a copy of this form to keep.

_____ Name of
Subject Age

Signature Date _____