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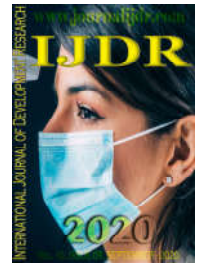
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RESEARCH ARTICLE

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## THE EFFECT OF AN INFANT DANCE CLASS THROUGH MEDIA WITH PARENTAL GUIDANCE ON SELF-STIMULATORY BEHAVIOR AMONG AUTISTIC CHILDREN

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### ABSTRACT

One of the areas that has remained unexplored in educational research is the effect of dancing and music on self-stimulatory behaviors among autistic children. According to the Center for Disease Control, 1 in 54 children are diagnosed with autism. The Diagnostic Statistical Manual as well as the National Institute of Mental Health includes “repetitive behaviors” as a symptom of autism. These behaviors are commonly known as “self-stimulatory behaviors” or “self-stims” (MayInstitute, 2020). The setting of this study were the homes of autistic children and their parents or caretakers. The study consisted of 18 children ages 4 to 14 years of age. The recorded online classes included Baby First TV programs including *Mama and Me: Sing Along* and *Zumbini Time*. Parents were instructed by behaviorists how to utilize the videos and pre and post-test measures compared on self-stimulatory behaviors.

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### INTRODUCTION

The goal of this study was to assess the effectiveness of an children video song and dance videos on the self-stimulatory levels and relaxation of autistic children. The MayInstitute (2020) defines self-stims when a child “engages in self-stimulatory behaviors such as rocking, pacing, aligning or spinning objects, or hand flapping, people around him may be confused, offended, or even frightened.” Studies have explored different methods on how to reduce self-stims among youngsters. In the 1970s, psychologists experimented with different and sometimes harsh methods in order to treat self-stimulatory behavior. Slapping children on the knee and backside was attempted but these methods were later seen as unethical (Bucher and Lovaas, 1968). Overcorrection involves a child needing to correct a behavior especially if a self-stim causes aggression or damage to property. For instance, if a child is rocking back and forth and knocks over his glass of milk, the child would be required to clean the area several times. These methods have shown promise (Foxx & Azrin, 1972).

There were also psychologists who attempted to use a pleasant and reinforcing environment to help soothe the children by using positive social interaction and verbal praise (Klaber & Butterfield, 1968). The development of brain scan technology and more use of the scientific method have yielded more up-to-date and less controversial approaches. The National Institute of Health (2011) published studies on how movement and exercise actually increase memory and how positive effects on the anterior cingulate cortex. Science Direct (2010) and Act4Autism (2011) advocates using Differential Reinforcement to reduce stimming. For instance, if a child is constantly their hands, reinforcing an “incompatible behavior” such as clapping hands can yield excellent results.

### DISTANCE EDUCATION

Schools, universities are other institutions are using remote tools to provide educational and psychological services including autistic services to parents due to CO-VID 19. The exact number of corona virus cases in the United States is impossible to determine, but U.S. officials estimate that it is likely around 20 million (Associated Press, 2020).

In the state of California, autistic services by behaviorists are now conducted by remote tools due to the virus. Psychologists, teachers and professors as well as certain medical practitioners are now turning to Distance Education due to this pandemic. Distance Education remains controversial. The U.S. Department of Education conducted a meta-analysis found that students who engaged in Distance Learning did modestly better than those students who received face to face instruction. However, the Brookings Institute conducted a national study whereby they found that college students who engage in Distance Education received lower GPAs and were more likely to drop-out of the class. Researchers are discovering that Distance Education is perhaps nuanced and specific to the subject and to the students involved. This study is not suggesting that technology replace the classroom or teachers. Perhaps technology can be used an extra tool to supplement the other educational strategies that schools and behaviorists currently use. For instance, the Center for the Advancement of Health, found that children ages two to seven years who viewed educational television had higher academic scores three years later than children who did not. What is true is that technology is now a necessity due to the pandemic, and finding the best usage of Distance Learning is now imperative.

## DANCING, MOVEMENT AND EXERCISE

Exercise promotes motor development in children and has shown to promote brain development (NIMH, 2011). According to the ParticACTION Report (2018), only 39% of children are reaching their recommended daily physical activity levels. The report also recommends that infants engage in safe physical activity such as play and dance. According to Dr. Clark, professor and chair of the Department of Kinesiology at the University of Maryland, “Adopting a physically active lifestyle early in life increases the likelihood that infants and young children will learn to move skillfully. Promoting and fostering enjoyment of movement and motor skill confidence and competence at an early age will help to ensure healthy development and later participation in physical activity.” The National Institute of Health (2015) published a study demonstrating that autistic children promoting “effective memory processing, including the prefrontal cortex, the parietal cortex, and the medial and inferior temporal cortex.”

The ParticACTION report lists the benefits of movement and exercise with children including:

Their brain health depends on it. A growing body of evidence indicates that physical activity in childhood is essential for a healthy brain and leads to improved:

- thinking and learning
- emotional regulation and self-control
- problem-solving ability
- memory
- brain plasticity – the growth of new brain tissue
- stress management
- ability to cope with anxiety and depressive symptoms
- self-esteem and self-worth
- attention and focus

There are many physical activities or exercises that parents can do to help promote the development of their children and promote brain development.

The important thing for parents to remember is that when they engage in exercises with their youngsters, it should be in a place where it is safe to perform these activities and they have a joyful time while doing it.

AustimSpeaks has the following recommendations for physical activity among autistic children:

**Start small:** The Centers for Disease Control and Prevention (CDC) recommends that children get at least an hour of physical activity daily. That’s good to know, but I suggest starting with a more modest goal and building from there. We’ve found that shorter periods of physical activity, spaced throughout the day, tend to be easier to maintain. Remember: The goal is to make physical activity a regular and enjoyable part of daily life. So, be patient and think long term.

Here are some ways to add physical activity into a daily routine:

- Walking to school (or work) – or at least some of the way.
- Walking the dog (if you have one).
- Turn TV advertisements into exercise breaks. I recommend a few minutes of a rigorous activity such as jumping jacks. Join your child in the fun.
- Make a family trip to the playground a regular, after-dinner activity. If you can walk there, even better.

Gradually expand the amount of time spent in these and other activities – with the aim of ultimately achieving the recommended daily hour of physical activity.

**Build motor skills:** Keep in mind that your child will need to build some fundamental motor skills to successfully participate in physical activities and sports. You can make this skill-building enjoyable by playing games that encourage your child to:

Move in different ways (e.g. run, jump, hop, and skip). Play with different types of equipment such as balls, bats and racquets (e.g. throw, catch, kick and strike). Practicing these skills at home can foster your child’s success in physical education class, while increasing the likelihood that he or she will enjoy other socially engaging physical activities such as playground games and recreational sports.

**Sample different types of physical activit:** Our analysis identified a wide range of activities that can deliver benefits. From table-tennis to swimming, from riding bikes to riding horses, there’s an abundance of physical activities that you or your child can try. I suggest sampling from the menu.

### **Ideally, include one or more activities that encourage:**

**Fitness.** An activity that involves moderate to vigorous activity – activity that gets a person breathing heavily.

**Social interaction.** An activity that involves one or more other people, such as tennis or catch. **Independence.** An activity that can be done alone, such as a home fitness or yoga routine – perhaps with the help of a video.

**Be a role model and enlist friends and family:** As a parent, you are the most important role model for your child. I

encourage you to model an active lifestyle for your child. Show them the enjoyment and value you gain from being active. Next, consider the many people who interact with your child on a daily or weekly basis and how might you enlist them to encourage your child's physical activity. Teachers, especially physical education teachers, can be a great influence. Share your aspirations and strategies for your child. If your child has an Individualized Education Plan (IEP), be sure to include physical education goals in your IEP discussions. If possible, invite the PE teacher to attend the IEP meeting. Also consider contacting the people who run recreational sports programs in your community. Some may worry that they lack the skills to engage and include someone with autism in their programs. You may be able to give them the confidence they need by sharing your strategies for communicating, motivating, and instructing your child.

### **Tips for making physical activities autism friendly**

#### **Here are three practical strategies commonly used in activity programs designed for youth who have autism:**

- Someone who understands. Ideally, we want people with autism – especially children and teens – to have access to physical activity programs led by facilitators who understand how to communicate and motivate participants in autism-friendly ways. This doesn't have to be a professional in the field of autism. It can even be a "peer tutor" – another child who understands how to communicate with your child and can provide some one-on-one support.
- Routine. Most of us need routine, and this appears to be especially true for many people on the spectrum. I suggest building a regular and predictable structure into the physical activity program. Create a visual schedule to help reinforce the routine. (See the Autism Speaks Visual Supports Tool Kit link above for instructions on making a visual schedule.)
- Get visual. Many people with autism are visual learners. Visual supports such as task cards, physical demonstrations and video modelling often prove very helpful.

## **METHODS**

Eighteen autistic children, including sixteen males and two females ages four to fourteen participated in the study. The setting were the homes of autistic children whose parents and caretakers received behavioral services from a licensed psychological non-profit institute to provide guidance and education to the parents. The services were conducted remotely due to CO-VID. Each child had been previously diagnosed with autism by a licensed physician or licensed psychologist. All children suffered from self-stimulatory behaviors in varying degrees. Self-stimulatory behaviors were defined as the following behaviors lasting 30 seconds or longer:

- Rocking back and forth
- Pacing
- Aligning or spinning objects
- Hand flapping
- Staring at an object

- Banging one's head or other repetitive self-injurious behavior (these behaviors were immediately intervened by behaviorist or caretaker to avoid injury)

The parents were first shown BabyFirstTV video programs including *Mama and Me: Sing Along* and *Zumbini Time*. A parent or caretaker were instructed to show these videos to their children for a five-minute period when their child was "not" engaging in self-stimulatory and encourage their child to dance and sing in the manner the videos suggest. The parents were instructed to sing and dance along with their child and use a great deal of verbal praise. The parents practiced these behaviors with a behaviorist remotely instructing them twice a week at thirty-minute intervals for two weeks. After the two-week period, set times were created for the behaviorist to return remotely and observe and record self-stimulatory behaviors. The parents/caretakers were also instructed to turn on the recorded videos and encourage their children to dance and move whenever they engaged in self-stimulatory. The purpose of this was three-fold. First, to use Differential Reinforcement or encourage an incompatible behavior to self-stims. Second, to teach the children a functional type of movement. Finally, to help the children learn to control their body movements by starting and stopping movements or becoming more cognizant of their physical activity. These sessions included two visits for two hours each per week for four weeks by the behaviorists.

## **RESULTS**

Before video dance and music treatments began, the children had an average tantrum rate of 5.21 per day. After a month of intervention classes, the rate went down to 2.68 per day. A t-test was conducted to determine the impact of the classes on self-stimulatory behavior.

P value and statistical significance:

The two-tailed P value equals 0.0177

By conventional criteria, this difference is considered to be statistically significant.

### **Confidence interval:**

The mean of Group One minus Group Two equals 2.53

95% confidence interval of this difference: From 0.47 to 4.59

Intermediate values used in calculations:

$$t = 2.4857$$

$$df = 36$$

$$\text{standard error of difference} = 1.016$$

Group	Group One	Group Two
Mean	5.21	2.68
SD	3.74	2.38
SEM	0.86	0.55
N	19	19

## **DISCUSSION**

This study was conducted to determine if video online child dance and music classes would have an impact on self-stimulatory behavior. Extraneous variables are in question here as one could argue that the children simply matured over time which was the real reason for the significant decrease in stimming behavior.

However, when the children began the classes, the parents reported that their children had been engaging in self-stimming for over a year and in some cases for over four years. According to the Journal of Behavioral Analysis, children engage in self-stimming behavior for several reasons including:

- Frustration when not able to complete a difficult task
- Soothing behaviors to drown out noise or too much stimulation
- Self-regulation due to not understanding one's own emotions
- Seeking attention from caregiver or others
- Escaping an environment or situation that is unpleasant

Scientists are still struggling as to the mystery of why many autistic individuals self-stim. It is most likely different reasons for different individuals. As discussed earlier, movement and exercise develop the brain. There is more and more research on how the autistic brain is different from those without autism. For instance, 95% of right-handers and 70% of left-handers speech is processed in the left cerebral hemisphere. People with ASD often have reduced leftward language lateralization. This may be the reason why autistic people have a higher rate of being lefthanded compared to the general population. Also, the deep folds and wrinkles in the brain may develop differently among autistic individuals. With autistic brains there is more folding in the left parietal and temporal lobes and in the right frontal and temporal regions (Kohli et al, 2019). The method used in this study was a form of Differential Reinforcement. The children were encouraged and praised to engage in an incompatible behavior to self-stimming. For instance, if a child is simply rocking back and forth, the child would be encouraged to dance with the music and/or dance with one's parent or caretaker. Cynics could argue that there is a fine line between rocking back and forth and dancing; however, the behaviorists and parents defined dancing only when the child starting to engage in a completely different type of movement. For instance, if a child was simply sitting on the couch rocking, a caregiver would then turn on the video and encourage the child to stand up and hold hands with a parent and move to the music. Children who refused were recorded as dancing or stopping the self-stimulatory. Also, the overall self-stimulatory behaviors did decrease per day among the children.

More studies are needed to determine the true impact of video exercise programs on autistic children. Future studies need to emphasize brain-scan technology to determine if such programs have a positive impact on the brain activity as well as behavioral measurements. It is important to note that the parents and caregivers also showed a decrease in stress as their children stimed less. The parents were given the International Stress Management Questionnaire before and after the video treatments. Parents showed a 22% decrease in stress. Parents also gave a 94% average satisfaction rating on the treatments their children received.

One parents stated "the experience increased the positive time I have with my child." More investigation is needed to determine dthe true impact on behavior, brain activity and parental stress with the autistic population.

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