

The Effects of Rhythm in Group Music Therapy on Individuals with Autism Spectrum Disorder

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### Abstract

The purpose of this paper is to explore the effects of a drumming activity using structured rhythms on a group of school-aged children diagnosed in the autism spectrum from the perspective of professionals who work with them. Music therapists historically used rhythm-based activities to build rapport with clients, provide a framework for therapeutic expression and improve cognitive functioning. There have not been published experiments measuring the effects on group cohesion for individuals on the autism spectrum using drumming. The researchers developed a survey questionnaire to measure differences in behaviors related to attention and social cohesion between days using a drumming activity (d) and no drumming activity (nd). Seven participants working in an after-school program for students diagnosed with ASD were recruited to fill out the survey. Results yielded no distinct differences between (d) and (nd) although there was a positive total of .1 with peer-to-peer interaction and .04173 with peer-to-adult interactions in favor of drumming in the category of social attention. Limits of the study included too few trials and inconsistencies with the participants' attendance. Anecdotal observation suggests the drumming activity provided useful distraction for the students to environmental issues. Recommendations for future studies are discussed.

## The Effects of Rhythm in Group Music Therapy on Individuals with Autism Spectrum Disorder

In this paper we explore how a group school-aged individuals diagnosed with Autism Spectrum Disorder (ASD) socialize after experiencing a drumming activity. The rationale for doing a group rhythmic activity is the application of theories surrounding rhythm and cognition discussed in a review of literature of music therapy. Rhythm has been an essential tool for the practice of music therapy to build rapport and increase social attention. The research posited that if rhythm were applied to a group of individuals with autism, noted for deficits in social behavior, would there be a positive effect in group cohesion as measured through the perceptions of the professionals that worked with these individuals.

### **The History of Autism**

ASD is frequently referred to as a neurodevelopmental disorder (Kim, 2006). It is observed as starting in one's early childhood and persisting throughout the lifespan. ASD presents a wide range of characteristics including; impairments in social interactions, communication dysfunction, repetitive and stereotypical behaviors and interests (Bachevalier & Loveland, 2006; Kim, 2006; Reschke-Hernandez, 2011). Among the social deficits stated in the Diagnostic Statistical Manual (DSM-5) are; great difficulty in responding or initiating social interactions, absence of interest in peers and intolerance to specific sensory stimuli such as certain sounds, and textures (American Psychiatric Association, 2013). At the current time there is still no evidence of an underlying singular brain dysfunction identified with the disorder (Bachevalier & Loveland, 2006).

An etiology of autism commonly begins with Dr. Kanner (1943) who first used the term to describe a group of young children showing an inability to establish contact with the people around them (Kim 2006). Later, professionals generally attributed the cause of ASD as related to

early trauma and identified it as an attachment disorder or a form of childhood's schizophrenia (Kim, 2006; Reschke-Hernandez, 2011). It wasn't until 1980 that autism was added to the Diagnostic and Statistical Manual of mental Disorders with a clear and defined set of criteria. This addition represented a shift in the way autism was looked and treated as more highly structured behavioral management paradigms were utilized with the population (Dempsey & Foreman, 2001; Kim, 2006). Some of these treatments included: Treatment and Education of Autistic and Related Communication-handicapped children (TEACCH), Behavioral Package, Lovaas techniques, Pivotal Response Training (PRT) and joint attention intervention (Kim, 2006; National autism Center, 2009). The trend towards behavior-focused approaches represented an attempt by clinicians to show greater efficiency and reliability in meeting the needs inherent in the ASD population (Reschke-Hernandez, 2011).

Current literature suggests that autism is the product of multiple and varied neurological events and not the result of a singular area affected in the brain (Demsey & Foreman, 2001; Williams et al., 2005). Bachevalier & Loveland, (2006) suggested that early pre- and early- natal brain development might account for the varied affects seen from person to person in the spectrum as a whole. It follows an effective treatment-design should also be varied if it is to improve one's ability to generalize concepts experienced in social and environmental contexts (Wigram & Gold, 2006). According to Temple Grandin (1988), a supportive program should have "flexible no-aversive behavior modification, sensory treatment, speech therapy, exercise and music therapy". Kim, et al. (2008) state that music is useful as a "therapeutic medium" because it can meet needs at many different levels yet provide flexibility to overcome the 'more rigid characteristics' found in ASD.

### **History of Music Therapy Treatment of Autism**

Music therapy has long been a clinical service used to enhance the quality of life for individuals with ASD. In the 1950's music therapists applied basic music education principles using dance, rhythmic and singing activities as a means to achieve certain goals (Reschke-Hernandez, 2011). These goals included; socialization, recreational skills, improved emotional affect and self-expression. Sherwin (1953) noted that many children with autism displayed an "unusual interest in music" with the "ability to reproduce" songs with high accuracy. Many music therapists became attentive to the unique musical abilities and interests observed with children with autism, leading to more focused and specialized goals and objective (Reschke-Hernandez, 2011). Stevens and Clark (1969) published the first experimental study measuring the effects of music therapy on children with autism highlighting the need to establish efficacy in the field.

Over the years, a variety of approaches and techniques were developed to meet the needs for individuals with autism (Kim 2006; Reschke-Hernandez, 2011; Wigram & Gold, 2006). Among these were improvisational techniques used to build communication and social rapport through musical exchange (Edgerton, 1994; Kim, 2006; Nordoff & Robbins, 1977). Nordoff & Robbins (1977) suggested that music therapy has been helpful for individuals within the autism spectrum because it is experienced as a 'non-threatening medium' that facilitates social engagement. Other music therapy treatments that have been written about are: the use of social stories with songs, an adaptive playground with musical instruments, music improvisation to promote communication and play skills combined with music activities to encourage behaviors associated with social interaction (Brownell, 2002; Kern & Aldridge 2006).

In 2004, Whipple reviewed 11 studies using music therapy treatments with control groups of no-music and found evidence of significant benefit. The author also stated the need for more

research replicating treatment success before conclusiveness with the ASD population could be established. The push for greater efficacy has involved music combined with evidenced-based practices. These include Behavior Package (BP) or joint attention intervention (National Autism Center, 2009), to enhance social recognition for children with ASD (Kern, 2007; Kim, 2006).

### **Rhythmic Approaches used in Music Therapy**

The use of rhythm has been a part of active music therapy paradigms in clinical scenarios other than ASD. Staum (1983) used rhythmic stimuli to positively influence gait training for patients in physical rehabilitation. Slotoroff (1994) used a drumming technique to foster assertiveness, support anger management and develop coping mechanisms for patients recovering from trauma at a short-term psychiatric setting. The author noted that all of the patients managed to sustain self-control through the drumming process despite experiencing feelings of heightened arousal. The author also stated the technique was only appropriate for individuals fully able to comprehend the purpose of the process.

In the autism spectrum, music therapist looked at rhythm as a way to facilitate motor planning tasks and induce greater social awareness (Nordoff & Robbins, 1977; Thaut, 1984). Thaut (1984) theorized that varying tempos in drum or percussion play might break motility patterns that block social and language learning in children with ASD.

Nordoff and Robbins (1977) were able to build communication and rapport with children on the autism spectrum using a technique called ‘beating’ which involved matching the child’s style of sounding rhythm. This is performed in the context of improvised play and assists in establishing a relationship between therapist and the child. At the center of this relationship through musical interaction is the “basic-beat” or “underlying time base of coherent musical activity and experience.” (p.134) The awareness for the child of playing in the same time frame

as the therapist, suggests adaptation to musical change (e.g. tempo motility) which supports the autistic child's need for improved ability to respond to social cues in their immediate environment.

The research of Thaut suggests that rhythm can positively affect the behavior of an individual at the biological level (Thaut, 2013). According to Thaut, a human's motor system is impacted by the frequencies of a vibratory outsource to work in more highly coordinated patterns of time. A technique called rhythmic auditory stimulation (RAS) was developed to improve motor functioning impacted by motor related disabilities (e.g. stroke, Parkinson's disease, traumatic brain injury, etc.). Typically, RAS is used to improve gait-training. Unlike "beating" as employed with Nordoff-Robbins as a way to engage the child by connecting to their level. RAS involuntary affects the client to adjust to the therapist's mode of sounding rhythm (usually electronically created) and in general involves very little social interaction in the therapeutic process. Also the rhythmic style in RAS is metronomic or steady-beat in contrast to the changing and varied rhythms frequently used with creative music therapy. In a study using RAS to measure a person's ability to adapt to changing rhythmic intervals (Tecchio, Salustri, Thaut, Pasqualetti & Rossini, 2000), it was found that neuronal activity in the auditory cortex functioned to adapt at the pre-conscious level. This supports the idea that humans (and other vertebras with similarly functioning auditory cortexes) possess an organic adaptable timing structure.

### **Rhythmic Entrainment**

An important concept that helps to explain the effectiveness of RAS is rhythmic entrainment (RE). This concept was originated in 1665 by the Dutch scientist, Christian Huygnes, when he made the discovery that clocks sharing the same surface would entrain or become locked in a synchronized ticking pattern (Becker, 1994). Thaut (2013) describes rhythmic entrainment as

phenomena where “the different amounts of energy transferred between the moving bodies due to asynchronous movement periods cause negative feedback. This feedback drives an adjustment process in which the energy is gradually eliminated to zero until both moving bodies move in resonant frequency or synchrony (p.31).” More broadly put, RE describes the phenomena of two or more independent processes converging in a “common pattern” (Becker, 2004). This suggests that a consistent rhythmically based activity has the potential to increase an individual’s ability to adapt to their environment.

The use of RE has been used in various healing paradigms to assist with affecting respiration, motor movements, altering brain waves and subtle changes in body movements (Strong, 1998). RE was applied with a young female diagnosed with autism by using pre-recorded music designed to entrain towards a more relaxed state (Orr, 1999).

Another key application of RE has been to assist with stimulating the effects of trance behavior (Becker, 1994, 2004). A trance state of ‘mind’ has been reported to include intense feelings of focus, decreased sense of immediate concerns, and access to types of experiences and knowledge not typically perceived during “non-trance states”. According to Becker (2004), trancing occurs within a communal and lively environment and utilizes strenuous activity that is very often accompanied by music. Meditation, in comparison, typically occurs in solitude away from distractions. It occurs in stillness and transcends emotions.

Individuals with autism benefit more from activity-based approaches than insight-oriented passive therapies (Reschke-Hernandez, 2011). Becker (1994) stresses the importance of what she calls, ‘bodily enactment’ with the suggestion that learning occurs at the ‘skin level’. As Becker (2004) states, “we are constantly changed by our interactions with the world while simultaneously changing the world” (p. 11). This quote suggests that the brain works in a

rhythmic fashion to coordinate speech to include the body movement of gestures with tonal qualities of voices. This corresponds with Nordoff & Robbins (1977) who developed rapport with children with autism by combining chants with rhythms and expressive movements. By using an active therapy that combines familiar language, repetitive rhythms and supportive movement it may be possible to provide individuals with ASD an enhanced social event that also improves their auditory processing to bring greater social awareness and attentional focus.

### **Group Music Therapy**

Many of the experiences with trance described by Becker (1994, 2004) occurred in a group setting. In contrast, many of the therapies for autism reviewed in this paper were provided in settings of one-to-one. The group therapy experience may offer individuals with autism a unique opportunity for social growth. Regarding the use of group therapy in the general population, Yalom (2005), states it can be more effective than individual therapy in improving social dysfunction as found in issues such as social stigma, isolation and for the development of coping skills. This type of support seems well aimed in approaching the social deficits that characterizes the ASD population (American Psychiatric Association, 2013; Bachevalier & Loveland, 2006).

One challenge for the individual with autism in traditional group therapy paradigms is the frequent use of verbal communication and verbal processing alone (Bachevalier & Loveland, 2006). Combining music therapy practices with the type of group therapy presented by Yalom could potentially provide non-verbal inclusion of greater social interaction for individuals with autism. Drumming and other rhythmic activities (Nordoff & Robbins, 1977; Slotoff, 1994), previously offered a facile approach for able-bodied individuals with difficulty with communication. Drumming/rhythm also provide the organizing effects of RE. As previously stated in this paper, the need to improve the individual with autism's ability to generalize

information in social and environmental contexts is a key aspect towards greater social functioning. The effect of rhythm may assist individuals to process and organize stimuli. Rhythmic activities as a central modality may provide social inclusion and the cohesive effects of rhythmic entrainment to replace the use of verbal therapeutic exchange alone.

In this study we used drumming as an attempt to reach greater group cohesion for school-aged individuals with autism. Cohesion as defined by Yalom (2005), is the level of ‘attractiveness’ that being in the group has for its members. Becker (2004) suggests that during the process of rhythmic entrainment/drumming there is a heightened sense of good feeling and good will towards one another further supporting this concept of cohesion. Among the qualities examined through the effect of drumming are; “open-ness”, “expressivity”, “risk-taking”, “spontaneity”, “supportiveness”, (Yalom 2005), and social interactions between adults and students. The subjects involved in this study are the educational professionals who work with and are familiar with students diagnosed with autism. This is a pilot study as the researchers did not find a study using drumming as a group experience to improve social attention in the autism population. The question posed by this study is if the use of repetitive rhythmic activities combined with chanting and symbolic movement can improve the social and attentional behaviors of a group of school-aged individuals with ASD as perceived by the educational professionals who work with them.

## **Methods**

### **Participants**

The participants of the study were direct care professionals (DCP) employed at the Anderson Center for Autism located in Staatsburg, New York. The researchers decided to survey the DCP regarding their opinion of the students diagnosed with Autism Spectrum Disorder participating in

the After-school program. The DCP maintain informed opinions regarding individual students' patterns of typical behavior as well as the potential benefit of music therapy on the student's interpersonal relationships. Researchers invited the DCP to participate in the study by: 1). offering a pamphlet describing the study, 2). emailing a description to bring attention to the study, and 3). held a meeting providing managerial staff information to inform employees of the study. A total of seven subjects volunteered for the study. They were all female and above the ages of twenty-one. There were not any restrictions regarding age or gender used in recruitment of volunteers. Each volunteer signed an informed consent for study inclusion (see Appendix A for informed consent information).

### **Materials**

A variety of drums and percussion was used in the warm-up activity of the study. Percussion instruments included djembes, tubanos, congas, bongos and shakers. The instruments were supplied by the school upon request. These instruments were selected based on the students' familiarity with them and the level of function required in playing them.

A survey was used to gather information regarding the participants' perception of how the students performed in their regularly scheduled after-school program following the drumming warm-up activity (see Appendix B for the questionnaire). Questions focused on the students' social interaction and attentional skills based on Yalom's (2005) description of group cohesion. The survey consisted of seven questions with a general comment section at the end.

### **Settings**

The study took place in a school auditorium at the Anderson Center. The auditorium was the weekly meeting place for an after-school program called the drama club. The club consisted of 12 to 20 students and 6 to 8 DCP's. Professionals hired to run the club provided the students with

varied social and musical activities. The DCP accompanied students to the auditorium for eight consecutive program meetings, each meeting being for a one-hour session. There was an interruption of a two week end-of-school-year recess between session week 3 and 4 (end of June to the second week in July).

### **Design**

A concurrent schedule/alternating treatments group experimental design was used for the subjects volunteering in the experiment. Drumming as a warm-up activity was implemented on the first, third, fifth, and seventh treatment days. On the second, fourth, sixth and eighth days, no drumming activity was provided as the after-school program ran continuously for its regularly scheduled hour-long time period. The survey-questionnaire was given to the subjects for all eight days so as to measure the difference, if any, between the days with drumming and the days without.

### **Procedure**

Researchers set up rhythmic instruments (on the weeks 1, 3, 5, and 7) in a semicircle on the floor in front of a stage prior to the arrival of members of the drama club. As the students arrived they were invited by researchers to sit at any drum while their accompanying DCP sat in the seats of auditorium. Only the students were invited to participate in the rhythmic activity and were told they could refrain from participation in the drumming activity. The researchers composed six songs for the study (see Appendix C for the drumming chants). The content of these songs emphasized the following: repeating rhythms expressed through percussion played by both the researcher and the students, chants using nature themes anticipated to be familiar to the students and stylistic movements meant to support or reflect lyrical content. These techniques were utilized over the treatment cycle with two songs for each day the music warm-up was

presented and with the last treatment day concluding with three songs. The selection and order of the songs were determined by the researchers to be differently paired throughout the treatment process. Each song lasted approximately four to five minutes each, for a total time eight to ten minutes. Upon completion of the warm-up activity as implemented by the researchers, the facilitators of the drama club gave an initial direction to the students to move to their scheduled activity frequently to dance on the stage.

The researchers presented the survey to the participants at approximately ten minutes before the end of the drama club. The investigators waited for each subject to complete the survey to ensure completion, avoid interruption and reduce the possibility of misplacement. The subjects' names were encoded using colors and months to ensure anonymity. It was explained to the subjects that they could withdraw from the study at any time. The researchers and the DCPs agreed that if at any time they felt a student displayed signs of agitation or any need to stop involvement in the drumming activity, they should intervene for the well-being of the student, especially in light of the difficulty some of the students presented regarding communication. This did not occur.

### **Results**

The statistical analysis of the survey questionnaire was divided into two general categories: overall results and social attention (peer-to-adult and peer-to-peer). Using Microsoft Excel, means were obtained for each of six from a total seven questions from the survey-questionnaire, separately for drumming and non-drumming days. Question 5 was examined for frequency of listed joint-attention related responses and comments made by the subjects. Because this question used frequency of subjects' listed responses and did not yield a mean score, it was omitted from the graph for overall results and discussed separately. Questions from the survey-

questionnaire were combined with the intention of showing the effects of drumming to improve social functioning in relevant categories.

Results from the overall category are shown Figure 1. These were derived by measuring the differences in means of each question for drumming (d) and non-drumming (nd) days. As the table shows, the data reflects no difference between the drumming and non-drumming sessions for any of the questions in the overall category.

Question 5 from survey examined the occurrence of joint attention for students during the after-school program after the drumming. Six operationally-defined examples of joint attention provided by the researchers were listed in the form of a checklist for the subjects to check-off with the inclusion of an option to comment on their own observations of other similar joint attention behaviors. A frequency total was calculated showing an average of 2.0 responses or an average of 3.3 responses per subject. Data from all other days from d and nd were roughly similar suggesting no difference in the joint attention sub-category.

The category of social attention was created to measure a possible developing trend with regards to peer-to-peer and peer-to-adult interaction for d and nd days as shown in Figure 2. The average mean of d days shows an increase of .04173 in regards to social attention involving peer-to-adult interactions. This was determined by adding the means of questions having to do with peers responding to adults (questions 1, 3, and 6) for d and nd days respectively and then subtracting the smaller number from the bigger one. There was an increase of .1 for averaged means on d days in regards to question combined related to peer-to-peer interactions (questions 2 and 7). This was determined using the same method as discussed for peer-to-adults. The scores show a positive rise in the responsiveness of peers to other peers and to adults on d days, although more trials are needed to state a distinct effect attributed to the drumming.

## Discussion

### Review of Results

The survey given to subjects consisted of seven questions each pertaining to a unique category of response by the participants in the program as observed by the subjects. Each category of response was compared for drumming (*d*) and non-drumming (*nd*) days. While results were not conclusive for any of the seven categories, there were encouraging signs that the effect of the drumming activity may have affected an increase in the hybrid Social Attention category for both peer-to-peer and peer-to-adult interactions. In question 5 (category of Joint Attention) results were recorded through a frequency or total number of responses on a checklist, plus an option for subjects to write in their own observation of a joint attention-type of example not already included in the checklist. Results showed less examples of joint attention on drumming days. It was determined after the experiment that the drumming activity reduced the after-school program time by about 10 minutes each of the 4 sessions thereby leaving less time for subjects to observe joint attention on drumming days. Lastly, there were only 3 write-in responses by the subjects, one of which was omitted from the study by the researchers for not qualifying as a joint-attentive type of response, suggesting a lack of understanding about joint attention as a concept. Perhaps an interview session with the subjects prior to the collection of data in which the purpose of each of the questions was explained might have aided comprehension and increased the number of write-in responses.

### Strengths and Weaknesses

In review of the strength and weaknesses of our experimental design there were some issues to be noted. Our session days/trials numbered 8 and were too few to gather conclusive data. Scheduling restraints in the after-school program limited the frequency and flow of our

study including the disruption of a 2-week summer vacation break in between sessions three and four. There were continual fluctuations in attendance of both the subjects of our study and the student/participants belonging to the after-school program. Subjects responding per sessions ranged from 3 to 7 offering some problems with consistency in the gathering of the data. Issues related to attendances are consistent in problems noted by Yalom (2005) with regards to short-term group therapy.

There were also concerns regarding disruptions and noise present in our study. Our setting was a school auditorium with a considerable amount open area and presented much potentially distracting ambient noise. There were also frequent interruptions and delays due to the staggered times of entry for different participating groupings of staff and students causing stoppages in our drumming activity.

Despite these delays and environmental issues, the drumming activity was readily accepted by the students and may have presented positive distraction from outside noise and visual happenings. The noise created through the group in their drumming was not observably disconcerting, reflecting valued qualities such as ‘open-ness’, ‘expressivity’ and ‘risk-taking’ inherent in the application of group therapy in Yalom’s (2005) description of valued group dynamics.

The general acceptance of the drumming activity by the students as evidenced by their participation and lack of off-task behavior and the positive statements offered by the subjects suggested that the use of drums and musical content used was a useful and valued modality for a group of students in this age-group and shared diagnosis. The drumming activity may have given the group a very accessible and functional way to get started. The strength of our method was that it provided shared inclusion to individuals with ranging ages, social and intellectual skills.

As previously noted, there were signs of positive differences in favor of drumming days for social attention. This suggests rhythmic activities can positively affect individuals diagnosed with autism's social awareness. This is especially encouraging with regard to the peer-to-peer interactions observed in our study as individuals with autism often struggle to develop relationships with others in the spectrum (Owen-DeSchryver, Carr, Cale & Blakeley-Smith, 2008) The fact that in our study there was the appearance of an increase in spontaneous interactions among group members corresponding to days when the drumming activity was used provokes more investigation into the use of rhythmic-based activities towards improved relationship building.

### **Recommendations**

As previously mentioned, there were limits and interruptions concerning the continuity of sessions potentially lessening the effect of drumming on social behaviors. Greater care to ensure consecutive trials would be necessary to elicit more conclusive data. Strength in data for future studies would also benefit from increased frequency of trials. It would also be beneficial to focus on the behaviors of the individuals during the drumming group and thereby making them the subjects of the studies. For example, researchers could see if group members who make eye contact or match rhythms during drumming are more likely to engage in social interaction after drumming. Future studies could also examine the affect of certain types of rhythms (e.g. fast vs slow, steady vs varied, with and without chants, etc. ...) on social behaviors for individuals in the autism spectrum. Another recommendation shared by one of the DCP's was to include the staff with the students to see if relationships between students became more dynamic.

### **Conclusion**

Rhythm-based activities like the drumming used in this study provide a stimulating, fun way to bring people with autism together. Individuals with ASD often display difficulty adapting to new people and new settings. A drumming activity may be a viable way to facilitate comfort and acceptance of transitioning to a new learning environment or broadening their social pool. The perspective of the researchers and comments shared by the subjects supported this. Future studies should strive for a higher number of frequencies in trials than were provided in this study to gather conclusive data. Still, the trend towards increased social attention behaviors on drumming days is encouraging. Used as a warm-up activity to an hour-long after-school program the students readily engaged and sustained attention throughout the activity.

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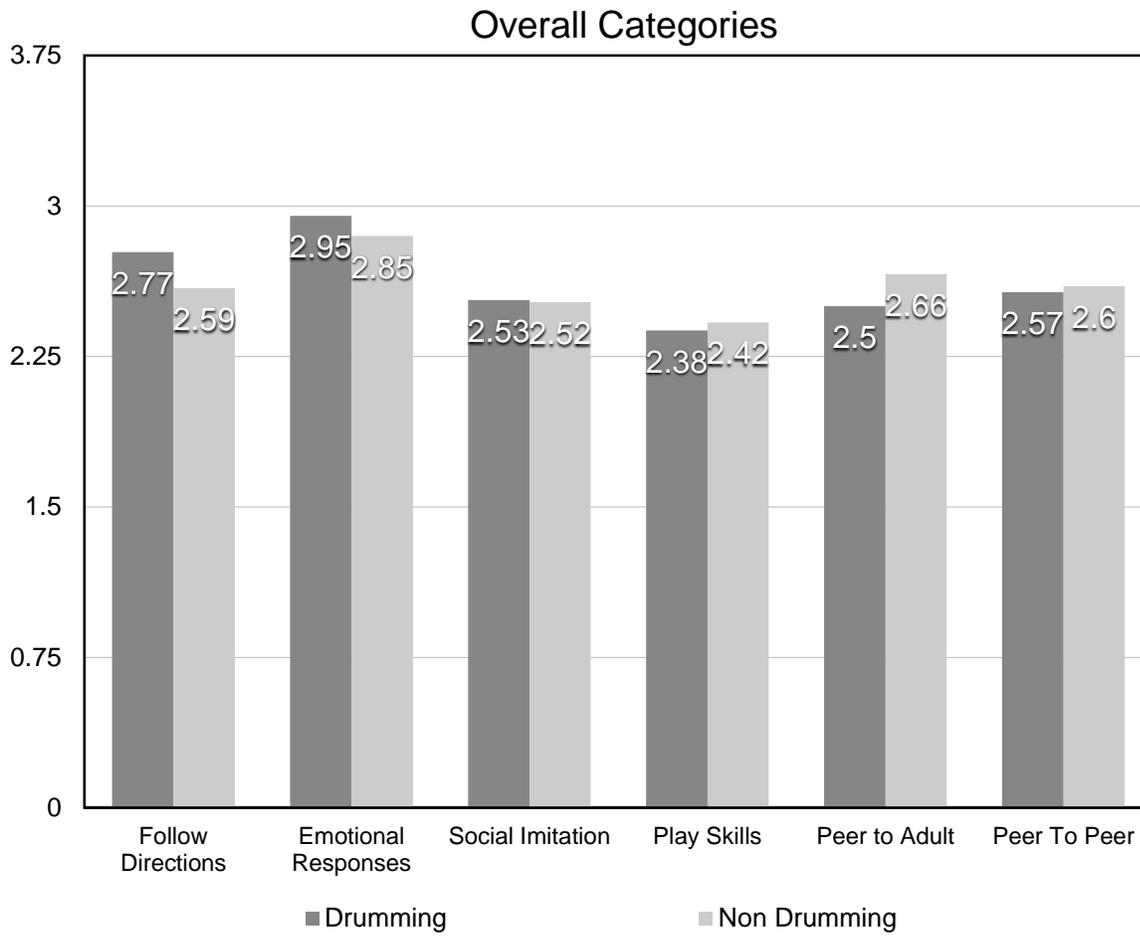
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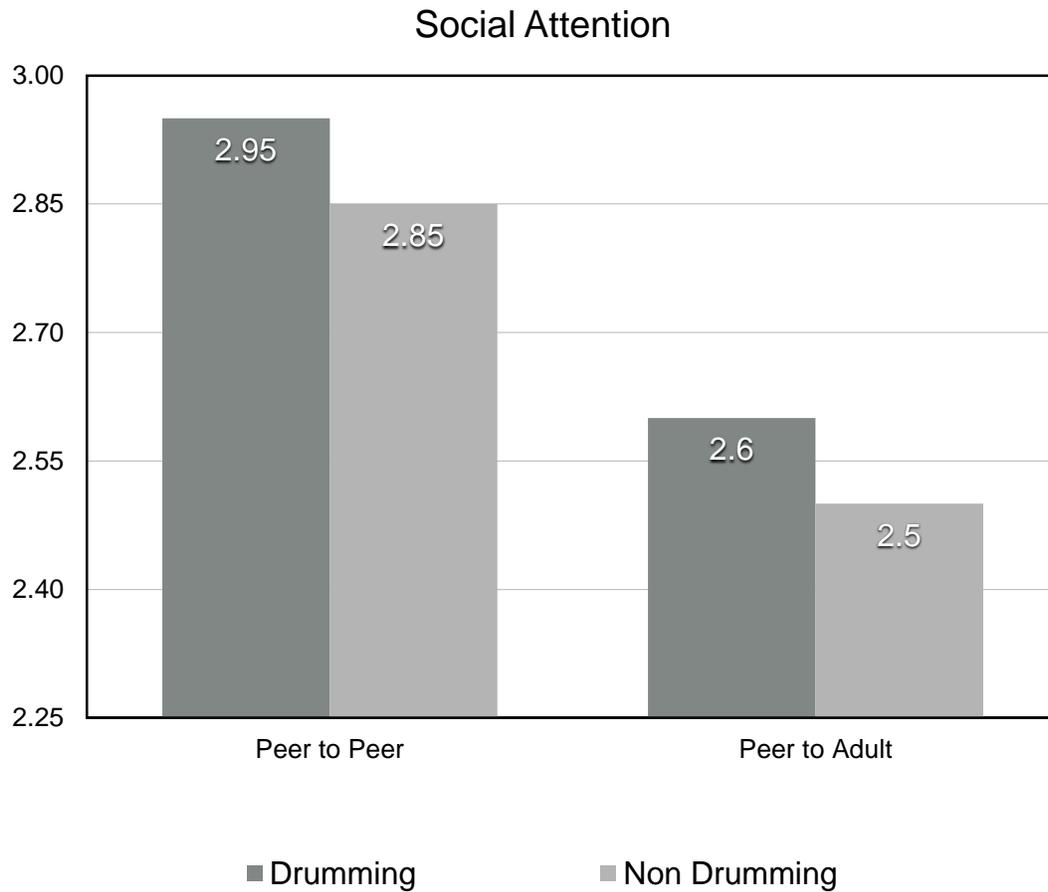
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*Figure 1.* This bar graph examines the relationship between drumming and non-drumming days in observable categories representing the students’ social interactions and attention.



*Figure 2.* This bar graph is comprised of two sets of comparisons measuring the affect of drumming on the students' abilities to attend in social situations with peers and staff.

## Appendix A

## Informed Consent Form

**State University of New York at New Paltz – Informed Consent Form**

**Study Title:** The use of repetitive rhythms embedded in a music warm-up activity to affect group cohesion based on the perceptions of professionals working with students diagnosed with autism in an after-school program.

**Name Of Principal Investigator:** Julien Valenstein

**Department:** Music Therapy Program

**Position:** Graduate Student

**Name Of Co-Investigator:** Tetiana Cymbal

**Department:** Music Therapy Program

**Position:** Graduate Student

**Contact Name And Phone Number For Questions/Problems:** Julien Valenstein ( [REDACTED] )

**WHAT IS THIS STUDY?** This is an educational research study conducted in order to complete a requirement of the music therapy graduate program for Julien Valenstein and Tetiana Cymbal. This study will only include participants who choose to take part. Please take your time to make your decision. Discuss it with your friends and family. You are being asked to take part in this study because of your professional connection in working with students participating in an after school-program at the Anderson Center diagnosed within the Autism spectrum.

**WHY IS THIS STUDY BEING DONE?** The purpose of this research is to find out if the use of a music warm-up activity combining composed rhythms with singing and movement enhance a sense of group cohesion or ‘togetherness’ for the students based on the perception of the subjects. This research is being done to develop ways to facilitate improved attention, social interactions and enhanced satisfaction for a varied group of individuals in the autism spectrum.

**HOW MANY PEOPLE WILL TAKE PART IN THE STUDY?** We anticipate approximately 5 people will be subjects in this study with 10 to 12 students participating in the warm-up activity.

**WHAT IS INVOLVED IN THIS STUDY?**

- The site for research will take place on the campus at the Anderson Center For Autism, specifically in the auditorium at the educational center
- 5 to 10 minute warm-up activity with drums, singing, chanting and movement at the start of an hour-long after school program
- Only the students with the investigators will participate in the warm-up activity
- The warm-up activity will be alternated with the regular after-school programming over a 10-week span
- As one of the subjects, you will be asked to answer a short questionnaire based on your general observations of the students at the end of each program
- The questions in the questionnaire will reflect your feelings and thoughts of the students general behaviors throughout the entire program session and not just with the warm-up activity

- The questionnaire should take approximately 5 minutes or less to answer and will be handed out at the end of each program for 10 consecutive weeks
- No information about any individual student will be asked for or collected in this study. We are only looking at how music affects the students' behavior at a group level.

**HOW LONG WILL I BE IN THE STUDY?** Your involvement in this study should last 10 weeks.

**The researcher may decide to take you off this study if \_\_\_\_\_.**

- If you are unable regularly attend on program days
- If at any time you show signs of distress that would interfere with filling out the questionnaire or allowing the program group to run as normal
- If the information shared is inappropriate to the aims of the study

**You can stop participating at any time. However, if you decide to stop participating in the study, we encourage you to talk to the researcher (and your regular doctor, psychologist, teacher, etc., first.)**

**WHAT ARE THE RISKS OF THE STUDY?** This study poses very little risk to the safety and privacy of the subjects and the students. The warm-up activity should be familiar and well accepted by the students as previously experienced in their after-school program. The questionnaire will not include any requests for personal information of the subjects nor the students. The right of the subject to refuse to participate will be honored at all times during the process of the study.

**ARE THERE BENEFITS TO TAKING PART IN THE STUDY?** Anticipated benefits include:

- Improved attention by the students during after-school program
- Increased appropriate social interactions by the students with other students and the professionals who work with them in the program
- Improved relationships between program participants (students and professionals)
- Increased sense of rapport and satisfaction with the program by program participants

**WHAT ABOUT CONFIDENTIALITY?**

The investigators will not collect personal information regarding the subjects or the students. Still, efforts will be made to keep any information you provide confidential. Keep in mind that we cannot guarantee absolute confidentiality. Any information that you share in this study may be disclosed if required by law.

**WHAT ARE THE COSTS?**

There are no costs required on your part to be involved in this study. Neither will you will receive payment for taking part in this study.

**WHAT ARE MY RIGHTS AS A PARTICIPANT?**

Taking part in this study is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may choose not to take part, may leave the

study at anytime, or not answer research questions, which you consider inappropriate. Leaving the study will not result in any penalty or loss of benefits to which you are entitled.

We will tell you about new information that may affect your welfare or willingness to stay in this study.

**CONSENT:**

**I have read or have had read to me the preceding information describing the study. All my questions have been answered to my satisfaction and this form is being signed voluntarily by me indicating my desire to participate in this study. I am not waiving any of my legal rights by signing this form. I understand I will receive a copy of this consent form.**

\_\_\_\_\_  
**Printed Name of Participant**

\_\_\_\_\_  
**Signature of Participant**

\_\_\_\_\_  
**Date**

THE DATE APPROVAL STAMP ON THIS CONSENT FORM INDICATES THAT THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY SUNY NEW PALTZ'S INSTITUTIONAL REVIEW BOARD.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

### Questionnaire

1. The group was able to follow verbal and gestured directions after the initial prompt

- most of the time       half of the time       rarely       not at all

2. You observed members in the group demonstrating enjoyment (the pleasure felt when having a good time) during their regular club activities (e.g. facial expressions, positive statements, body language)

- most of the time       half of the time       rarely       not at all

3. During times of movement instruction, the group was able to imitate the movement of the instructors

- most of the time       half of the time       rarely       not at all

4. Members of the group demonstrated attention towards each other during structured and free play activities

- most of the time       half of the time       rarely       not at all

5. Please check examples of the ways the group displayed attention toward each other during peer interactions;

- sharing a prop and moving in accordance with one another  
 sharing attention gaze while addressing each other non-verbally or verbally  
 imitation of another student's movements or speech as relevant to the activity  
 participation in turn-taking activities (showing the ability to 'wait')  
 singing with 2 or more of the group at the same time  
 playing musical instruments with 2 or more of the group at the same time  
 other not listed \_\_\_\_\_

6. Members of the group spontaneously (aka, unplanned by the instructors) displayed socially appropriate behaviors towards the instructors or accompanying staff

- more than 5 times
- between 3 and 5 times
- 1 or 2 times
- not at all

7. Members of the group spontaneously (aka, unplanned by the instructors) displayed socially appropriate behaviors towards other group members

**General Comments:**

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