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The Effect of Music vs. Nonmusic Paired with Gestures on Spontaneous Verbal and Nonverbal Communication Skills of Children with Autism Between the Ages 1-5

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THE EFFECT OF MUSIC VS. NONMUSIC PAIRED WITH GESTURES ON
SPONTANEOUS VERBAL AND NONVERBAL COMMUNICATION SKILLS OF
CHILDREN WITH AUTISM BETWEEN THE AGES 1-5

By

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A Thesis submitted to the
School of Music
in partial fulfillment of the
requirements for the degree of
Master of Music

Degree Awarded
Fall Semester, 2003

The members of the Committee approve the thesis of Kimberly J. Farmer defended on August 22, 2003.

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ABSTRACT

The purpose of this study was to determine if music vs. nonmusic paired with gestures increased the spontaneous verbal and nonverbal communication in children with autism between the ages 1-5. There was an experimental, music, n=5 group and a control, no music, group n=5. Data were graphically analyzed. The figures showed an increase in verbal responses for the music group. The verbal responses from the control group were inconsistent. Neither of the gestural scores indicated an increase, however the music group scored higher than the control group. Implications for replication are discussed.

REVIEW OF LITERATURE

Autism

The word autism is derived from the root “aut”, meaning self, and “ism”, meaning orientation or state. This could be defined as someone who is unusually absorbed in him or herself (Trevarthen, Aitken, Papoudi, & Robarts 1996). Autism is characterized by three main criteria. The criteria include impaired social development that is inappropriate for their intellectual development, delayed speech development, and insistence on sameness. These three criteria must be present before the age of 30 months (Schopler & Mesibov 1985). The World Health Organisation’s International Classification of Diseases, or ICD, defines Childhood Autism as impaired or abnormal development that must be present before the age of 3 years manifesting the full triad of impairments. These are in reciprocal interaction, in communication, and in restricted, stereotyped, repetitive behavior (Trevarthen, Aitken, Papoudi, & Robarts 1996). The Diagnostic and Statistical Manual of Mental Disorders, or the DSM-IV, defines autistic disorder as a Pervasive Developmental Disorder that interferes with many areas of development. These areas include social interaction, communication, and symbolic and imaginative play (American Psychiatric Association 1994). Kanner, the first to define autism, describes the condition he recognized as “early infantile autism” as a “biologically provided disturbance of affective contact” (Trevarthen, Aitken, Papoudi, & Robarts 1996). He has also characterized autism with sensory disturbances, unusual play and interest in materials, uneven cognitive development, and unusual body use including rocking or posturing (Schopler & Mesibov 1995).

Autism, a mainly male dominated developmental disability, is diagnosed behaviorally (Shonkoff & Phillips 2000). If compared, the behaviors of two children with autism would not be the same. Their autistic-like characteristics treated primarily through their inner motivation and preferences (Trevarthen, Aitken, Papoudi, & Robarts

1996). It is very difficult to evaluate autism due to the range of syndrome expression, which also makes it harder to fit into any known diagnostic and remedial classification (Lord & McGee 2001, Fay 1980). The unlimited list of characteristics includes deficits in reasoning about others' mental states (Shonkoff & Phillips 2000). Children with autism have been said to lack "creative induction" or reasoning that allows us to draw general conclusions from specific situations. Autism is also said to affect many functions of perceiving, intending, imagining, and feeling (Trevarthen, Aitken, Papoudi, & Roberts 1996). This lack of reasoning may furthermore cause these children to have a very difficult time understanding false belief, deception, and ignorance (Bloom 2000).

Children with Autism generally lack eye contact and the impulse or desire to communicate. The verbal responses they produce are generally echolalic (Giddan & Giddan 1984). Echolalia is defined as "copying or repeating the content and/ or intonation patterns of another person's speech" (Trevarthen, Aitken, Papoudi, & Roberts 1996). The symptoms of Autism, caused by physical disorders of the brain, include abnormal responses to sensations, i.e., sight, hearing, touch, pain, balance, smell, taste, and the way a child holds his/her body. Also present are immature rhythms of speech, limited understanding of ideas, and the use of words without attaching the usual meanings (Schopler & Mesibov 1985).

Normal Development of Language and Communication

Language normally begins to develop in children as early as between the ages of 1-2 months. This is the stage where the child begins cooing, gurgling and responds to stimulation by smiling or becoming startled. Between the ages of 3-6 months infants begin to babble, laugh, and call out for attention (Maurice, Green, & Luce 1996). Stokoe (2001) suggests that this period is when normally developing infants begin to understand that they are beings separate from the rest of the world. Giddan & Giddan (1984) agree that language development is based fundamentally on the child's nonverbal knowledge of self and his / her personal world.

At the 6-9 month stage the child will begin to babble using double syllables. Here is where we first hear words like “mama” and “dada”. During this stage the child will also imitate some consonants and inflections and will begin to look at objects and pictures (Maurice, Green, & Luce 1996). Imitation is a natural milestone in the development of speech and language. Children are prone to imitate and will increase this activity until sometime around the age of 2 ½ years, after which time imitation begins to decline in frequency (Kuczaj 1983).

When children are between the ages of 9-11 months they will begin to babble more extensively and imitate sound sequences. This is also the stage where preverbal gestures will appear. Roger Cox suggests that body positioning, eye contact accompanied by facial expressions, gestures, and temper tantrums are all forms of communication that do not involve language (Schopler, Van Bourgondien, & Bristol 1993). At this stage children will begin to point, play pat a cake, reach out to be picked up, wave bye-bye, play peek-a-boo, and respond to their own name (Maurice, Green, & Luce 1996). Normally developing infants will move their own hands in a more complex rhythmic pattern when they see a person. This is different from the way they reach out or point to an inanimate object (Trevorthen, Aitken, Papoudi, & Roberts 1996). The greatest reinforcement for further attempts at communication will be the responses the child receives from his / her natural environment during this stage. This will directly affect their motivation or desire to communicate (Giddan & Giddan 1984).

A child’s first true words will appear between 12-18 months. This word is often a noun and may not be very clear at first. Here the child will diminish babbling and echolalia and become very communicative. These children will demand attention by using gestures, words, and vocal play (Maurice, Green, & Luce 1996). They are beginning to use language as a set of symbolic messages that regulate joint attention and joint activity (Giddan & Giddan 1984).

Children begin to use two and three words phrases between the ages of 1½ and 2½. During this year of life they begin to increase their vocabulary up to 400 words and become able to listen to a story for approximately 5-10 minutes. They will say their own name, participate in verbal turn taking, answer what and where questions, use early prepositions, i.e., in and on, and use more descriptive language. This is also where

children will indicate a question by their inflection and intonation (Maurice, Green, & Luce 1996).

A child will begin using pronouns like “I, me, you, and mine with he, she, and it” between 2½ -3 years of age (Maurice, Green, & Luce 1996). They will begin to use language to express their wants and satisfy their needs. They will also use language to control others through simple commands and to express their attitudes and feelings (Schopler, Van Bourgondien, & Bristol 1993). When a child begins to use “I” less frequently and use more pronouns like “we” and “you”, this is a sign that the self-centered child is transforming into a “social being” (Fay & Schuler 1980).

The stages between 3½ - 5 years are when the child will become more conversational and begin to form sentences. They will develop the capability of following two and three step commands (Maurice, Green, & Luce 1996). They use language to explore and understand their environment. They will use pretending or imaginative language and become very informative, i.e., “I’ve got something to tell you” (Schopler, Van Bourgondien, & Bristol 1993).

Between birth and the age of five years is a period of remarkable linguistic and intellectual growth. Children transition from no language to understanding and expressing intentionality, cause and effect, and emotional states (Shonkoff & Phillips 2000). By the age of 5 or 6 years, children can process a complete language system with an internal understanding of its grammar, syntax, and structure. It is possible that language is part of the human neurological system (Daniels 2001).

Communication and Language Issues in Autism

Many children who are diagnosed with Autism will never develop language. Approximately 30% of children who are diagnosed with autism have no language at all. Those who do have some language produce odd vocalizations that are not considered speech or babble. When they do develop language they are capable of using correct pronunciation and reproducing grammatical constructions (Trevarthen, Aitken, Papoudi, & Robarts 1996). However, their speech is usually monotone or singsong (Bloom 2000).

They can display a mastery of speech sounds in later stages of speech development and they may demonstrate well-developed syntactic structure in their spontaneous language (Schopler & Mesibov 1995). Alternatively, children diagnosed with Asperger's Disorder, an autistic-like disorder with severe and sustained impairment in social interaction, have normal language development (Bloom 2000 and American Psychiatric Association 1994).

Language that does develop in children with autism can often be in the form of echolalia. This is the copying or repeating the content of another person's speech (Trevarthen, Aitken, Papoudi, & Roberts 1996). When developing language they will rely on echolalia instead of grammatical structures. These echoed sentences begin with having no intent or meaning (Schopler & Mesibov 1995). They will often reverse "I" for "you" and vice-versa (Bloom 2000). Children with Autism are unable to use functional language to share or request information (Schopler & Mesibov 1995). They will use echolalic phrases to ask questions. For example a child with Autism might say, "Do you want a biscuit?" to indicate that he / she wants a biscuit. They may even use simple words that they have associated with an action to request that action. They might say "apple" to indicate that they would like an apple (Bloom 2000).

These children are not aware of their environment. Their complex information processing is abnormal due to their lack of attention or ability to gain information. The attention of a child with autism can be described as overselective. This means that when they are given a cue they may only attend and respond to part of that cue (Schopler & Mesibov 1995). It has been suggested that this overselection could be the result of an overactivation of the brainstem mechanism of arousal (Schopler & Mesibov 1995). It can further confuse a child with autism when irrelevant cues are used. It is recommended to only use cues that have concrete meaning (Fay 1980). They often associate the wrong word with an action or behavior. In one example a child mistook truck to mean sausage because they were looking at a truck when their mother asked them to come and eat their sausage. They lack the capability to draw conclusions or transfer knowledge, which is usually accomplished by normally developing children by the age of two (Bloom 2000).

The language deficit in children with autism is a direct result of the lack of social and cognitive development, which characterizes autism (Schopler & Mesibov 1995 &

Schopler & Mesibov 1985). As infants, they do not anticipate being picked up by reaching out (Trevvarthen, Aitken, Papoudi, & Robarts 1996). These areas of development are critical for the development of language and communication (Schopler & Mesibov 1995). When speech is present in children with Autism it is not usually used spontaneously and functionally in a conversation (Trevvarthen, Aitken, Papoudi, & Robarts 1996). They are incapable of attending to and comprehending the conversations of others (Bloom 2000). The initiation of a conversation or topics and turn taking is also commonly absent. They will often show a deficit in comprehension, will not express original ideas, show lack of verbal reasoning, and lack of rapid word retrieval. Their expressive language is weak but their receptive language skills are comparatively normal. They have difficulty understanding and facilitating gestures and facial expression. They display abnormalities in eye contact, however this holds no significance on initiating communication (Schopler & Mesibov 1985 & Trevvarthen, Aitken, Papoudi, & Robarts 1996).

Children with Autism can often display strengths in written language and labeling visual stimuli (Schopler & Mesibov 1995). It has been shown that rhythmic play, group play, music, dance, and dramatic play can engage interest and increase motivation in language learning (Trevvarthen, Aitken, Papoudi, & Robarts 1996). Those who do not receive early intervention treatment do not outgrow these symptoms and those who do receive early intervention make dramatic improvements (Schopler, Van Bourgondien, & Bristol 1993).

The Use of Gestures and Sign Language

Our feelings can be naturally expressed and become language signs when they are accompanied by a manual gesture. These gestures add information about our emotions the way that adjectives add information about a noun. Visible signs can naturally represent the relationships of visible objects, creatures, and events. All normally developing children communicate gesturally before they begin to use language. It is a perfectly natural progression to understand gestures before language (Stokoe 2001).

Children with autism are limited in the use of nonverbal and verbal means of communication (Fay 1980). Supplemental use of a system of nonverbal communication may facilitate the acquisition of speech and serve to reduce the child's frustration during the early years of spoken language. Verbal directions paired with gestures have often been useful in increasing understanding (Schopler & Mesibov 1995).

Gestures can be used to express intentions, represent characteristics, and demonstrate the use of objects. They also express reactions. Barton has classified gestures into 5 categories. He suggests that we use gestures to point or indicate, regulate behavior of others, express feelings, represent the use of objects, and portray size or represent properties and aspects of objects and events, i.e., placing fingers together to represent a bird's beak. By the age of 4 months a child will begin to use pointing and stretching gestures to indicate that they would like to be picked up. A study by Volkmar & Cohen (1982) illustrated that most gestures used by children with autism indicated, "go away" or "be quiet". The children, who participated in this study, who indicated desires through gestures did really well when presented with sign language training (Schopler & Mesibov 1985).

Teaching sign language to children with Autism is used to support all other aspects of interpersonal communication. It can assist in overcoming sensory and motor handicaps. However, when children with autism use sign language they do not always use it to gain social contact or to share ideas (Trevarthen, Aitken, Papoudi, & Robarts 1996). Some form of signed English is usually chosen so that simultaneous communication may take place (Schopler & Mesibov 1985). However, American Sign Language has also been used to help establish appropriate communicative vocalization (Trevarthen, Aitken, Papoudi, & Robarts 1996). When signs are used as visual cues it can make it easier for children with autism to follow directions and make connections between words and concepts that may lead them to speak (Daniels 2001).

Sign language is only suggested when the child is communicating deliberately with natural gestures. If a child displays poor motor control or proficiency for speech production but shows a clear communicative intent they may also benefit from the use of sign language (Schopler, Van Bourgondien, & Bristol 1993). The use of signs and gestures has been said to facilitate motor control however the children are not making the

transfer to language comprehension they are simply reproducing the gestures or signs (Bloom 2000).

It is important to introduce signs or gestures within the context of a specific activity (Schopler, Van Bourgondien, & Bristol 1993). When signs are used as visual cues it can make it easier for children with autism to follow directions and make connections between words and concepts that may lead them to speak (Daniels 2001). For example when a child is echoing a question to indicate that they want something the educator or parent should make a gesture using the object the child wants and interrupt them saying “yes” (Maurice, Green, & Luce 1996). Signs need to correspond to words but be produced by hand movements. The visual aspect of using signs provides many opportunities for reinforcement. Creedon found in several of his studies that there was measurable progress in terms of greater socialization and fewer tantrums or self-destructive behavior (Fay 1980). It has also helped to decrease echolalia and other non-communicative expressions (Trevvarthen, Aitken, Papoudi, & Robarts 1996).

Although most children with autism do have a predictable way of expressing their emotions vocally, these means must be learned by others to be able to interpret it as communication (Schopler, Van Bourgondien, & Bristol 1993). Nonspeech communication systems should always be considered for any child with autism between 2½ - 3 years of age who is not naturally developing speech. However if the system is causing excessive levels of frustration, it should be stopped (Schopler, Van Bourgondien, & Bristol 1993).

Music and Music Therapy

Hairston (1990) notes that children with autism really enjoy the process of learning music. Children find both security and freedom in music. Music therapy instigates and supports developments in communication, i.e., joint attention, intentionality, initiation, imitation, variation, communication of feelings and use of words (Trevvarthen, Aitken, Papoudi, & Robarts 1996). Their positive response to music can affect their participation in activities that can help them achieve social, language, and motor functioning goals

(Hairston 1990). In a study by Brownell (2002) music was paired with social stories to reduce targeted disruptive behaviors i.e., talking too loudly and following directions, in children with autism. He found that the musically adapted social stories were an effective treatment option for modifying these behaviors.

Hoskins (1988) conducted a study that investigated the relationship between sung and spoken responses and standardized speech tests. She also investigated the use of music activities to increase language abilities. The subjects were children between the ages of 2-5 who were mentally retarded and developmentally delayed. These children were placed into a group with music activities that were designed to increase expressive language skills. She noticed a significant improvement in the Peabody Picture Vocabulary Test when antiphonal singing with picture cards was used.

Laird (1997) conducted a study to test the effectiveness of music on cognitive and communication skills in children with autism. The material that was paired with music was achieved sooner than the material paired with only verbal instruction. Wylie (1971) conducted a study to determine if music paired with speech therapy would increase spontaneous speech. Although the results were not statically significant they did show that the music group was more successful than the control group in producing spontaneous speech.

One music activity that has proven to be quite successful in modifying behaviors in this population is musical improvisation. It has been used to motivate and to promote pleasurable companionship. Improvisation can also encourage efforts to reach meaningful communication. The “spontaneity of improvisation directly engages and activates the rhythmic and sympathetic impulses from which all human communication comes from” (Trevarthen, Aitken, Papoudi, & Robarts 1996).

Edgerton (1994) executed a study where children with autism between the ages 6-9 received individual improvisational music therapy sessions for 10 weeks. After the completion of the 10-week sessions the results indicated that improvisational music therapy increased the level of communication behaviors in these children. The Checklist of Communicative Responses/ Acts score sheet, or CRASS, was designed especially for this study and used to measure the subjects’ musical and nonmusical behaviors. Moreno (1980) describes how a music therapist can increase nonverbal communication by using

improvisation techniques in one-to-one or small group therapy sessions. Thaut (1984) described that music can be used to support and facilitate the desire or necessity for the child to communicate. Improvised musical accompaniment can be used for crying, laughing, and movements to establish a relationship between a sound, rhythmic pattern, and movement. He found that using strong melodic and rhythmic patterns in verbal instructions along with visual cues secured better retention of the words being taught.

Music has also been used to support communication and to encourage and accentuate body expression and gesture in interaction and imitation (Trevvarthen, Aitken, Papoudi, & Robarts 1996). In a study by Madsen (1991) music was used with normally developing children to determine its affect on the number of words learned when it was paired with gestures. The subject's ability to transfer the words learned was also measured. The 60 first graders were divided into three groups. The groups were a music-gesture treatment group, a gesture only treatment group, and the control group. The results showed a considerable increase in the number of words learned and transferred by the music-gesture group over the other two groups.

An article by Nelson, Anderson, and Gonzales (1984) describes the many ways that music activities can serve as therapy with children with autism. One of the many goals it can help to achieve is in the area of language and communication development. They describe how music has been used with dance and sign language, "both of which involve communication of symbolic information through music." Music can also be used to encourage speech and vocalization. Hollander & Juhrs (1974) used an Orf-Schulwerk approach to work with children with autism. One of the most important ways they focused on language development was to include sign language. They found that it was a less threatening way for these children to communicate. It was not implemented to replace speech but to improve it. They found that in addition to using sign language, the "singing and repetitive rhythm aspects of the rondos lend itself to the development of speech in some autistic children". Buday (1995) found music to be a good strategy to promote better memory for manual signs with children with autism who have been exposed to simultaneous communication. Signs were taught with music and speech and then with rhythm and speech. The experimenter used rhyming phrases. The group with the highest number of correctly imitated signs was the group that received music. Music

also had a great effect on the number of words that were spoken correctly. Children who spoke during the music testing would either stop talking or their voices would become noticeably softer during the rhythm testing (Buday 1995).

Music therapy has been used to motivate and build relationships with clients, students, and patients. Research has shown that music activities can have a substantial impact on the behavior modification, nonverbal communication, and verbal communication of children with autism. The purpose of this study is to determine if music paired with gestures will increase both spontaneous verbal and nonverbal communication in children with autism between the ages 1-5.

METHOD

Subjects and Setting

The subjects of this study were 10 children, 9 boys and 1 girl, in the Metro Atlanta area. Each of these children had been given a diagnosis of having autism. Participant's ages ranged from 2-5 years old. The participants had a wide range of verbal and nonverbal skills. Each subject received 5 music therapy sessions. These sessions took place in their homes, at Bailey Speech and Language Clinics, Greater Atlanta Speech and Language Clinics, Walden School at Emory University, and at the Music Therapy Services of Greater Atlanta office. Each of these settings included their own distractions and complications. However, these subjects were accustomed to having some type of therapy in each setting.

Design

The design was experimental / control with repeated measures across 5 sessions. Subjects were randomly placed into either the experimental (music) n=5 or the contact control (no music) group n=5. Sessions were one-on-one except for the sessions at Walden School, which were divided into two groups of two.

Materials

The camera used for this study was a Panasonic 700x with digital zoom. The video camera was placed in a corner with a wide-angle lens to view all participants in the room. The tapes were watched repeatedly to ensure accurate data collection for each subject. Data was collected using the observation form (appendix A). Any word that the subjects said correctly was considered an accurate response. An attempted verbal response was any vocalization that was used purposefully. Any vocal stinging or babbling was not recorded as a response. Gestural responses were considered accurate if

the subject was purposefully imitating a motion, playing an instrument, or reaching for an object. It was considered an attempted response if they did complete the gesture. Verbal and nonverbal responses received a score of 1 or 2. A score of 2 was given for an accurate verbal or gestural response and a 1 was given for an attempted verbal or gestural response. An independent observer viewed 10% of the digital tapes with reliability computed to be .91%. Miscellaneous materials used in the activities are listed in the session plans in Appendix B.

Procedure

Each session lasted approximately 20 minutes and was based on five different activities. Gestures and concrete examples were used in both groups. Each session began and ended with the appropriate greeting. Next there was a movement activity where the subject modeled the therapist to touch different body parts, clap, and turn around. Then there were a series of “mystery” items in a bag that were identified. The subject was asked to blow and pop bubbles, walk like a dinosaur, and make noises like a cat, dog, and dinosaur. During the third session a cuing system was used by omitting labeling words and eliciting a response from the subject. The only difference between the nonmusic and music sessions was the use of the guitar, drum, and singing. (See Appendix B for activities)

RESULTS

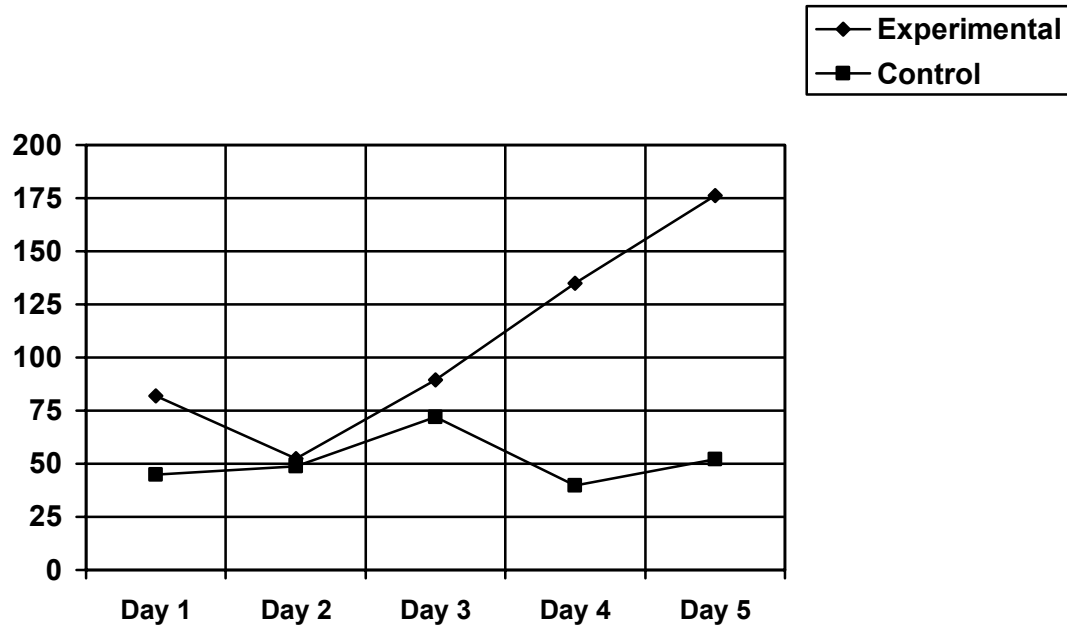


Figure 1
Verbal Responses

Results were graphically analyzed. (See Appendix C for raw data.) Figure 1 shows the mean of the verbal responses from the experimental vs. the control group for each of the 5 sessions. There is a clear increase in verbal responses in the experimental, or music, group. The mean increased by 53% over the 5-session period. The control group was very inconsistent and showed no substantial increase. The verbal responses increased by 13.8% from day 1 to day 5 in the control group.

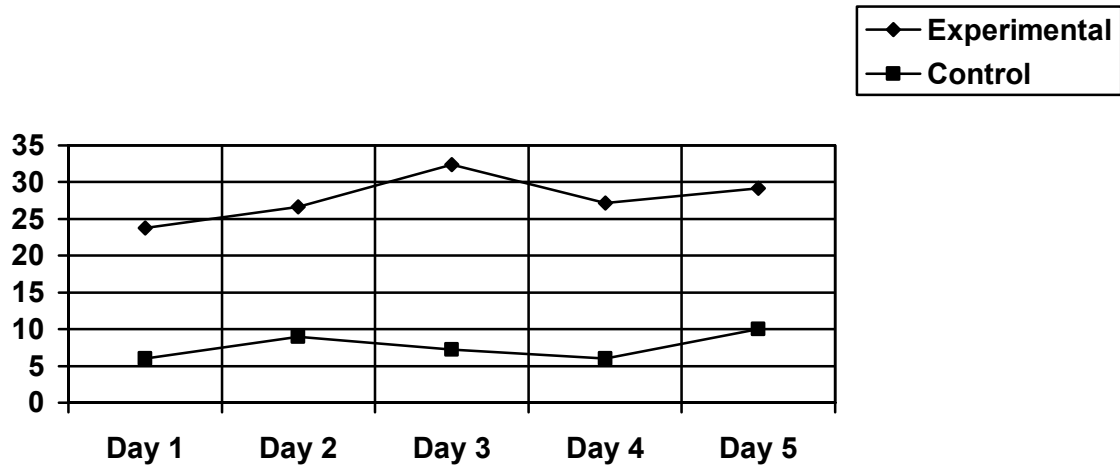


Figure 2
Gestural Responses

Figure 2 shows the mean of the gestural responses from the experimental and control groups. Neither of these groups showed a substantial increase. However, the music group consistently scored higher than the control group even on the first day. Overall, they had more than twice the gestural responses than the control group. It approved music-facilitated use of gestures immediately.

DISCUSSION

The purpose of this study was to determine if music, in comparison to no music, paired with gestures could increase spontaneous verbal and nonverbal communication in children with autism between the ages of 1-5. The graphs show a substantial increase in verbal responses for the music group. The verbal responses from the control, or nonmusic group were very inconsistent. The gestural responses did not increase however, the music group scored consistently higher than the nonmusic group. These data reinforces the idea that music is a great facilitator for gestures, signs, and movements. However, the overall success with verbal vs. gesture responses also shows the great difficulty that children with autism have with motor functions. This is probably why total communication, using sign language, has not become a preferred method of treatment for this population.

There were several limitations in this study. Each of the settings had their own distractions. Sometimes people were coming in and out of the room and there were always a lot of interesting toys laying around for the subjects to play with. One of the places had a huge ball pit. The music session for 1 individual actually took place in the ball pit. The great thing is that this subject had a huge verbal score that day. The music group had an easier time staying on task despite all these distractions. This may have contributed to their increase in verbal scores.

It was also interesting to see how well they all did despite the inconsistency of time of day and location. These are things that can be very hard for a child with autism to cope with. It is very important to establish routines with these children so that they can make easy transitions from one activity to the next. Each of the subjects were accustomed to having some type of therapy in each of the settings. It may have helped that the sessions took place in their natural environments. The control group had a harder time than the music group. It appeared that as soon as the “hello song” began the music subject was thinking, “okay I know what this is” and they would come over to the guitar.

One of the subjects in the experimental group was highly echolalic. He was singing one of the songs perfectly by the second session. Echolalia is a milestone for normal

language development. Even though a child usually out grows this by the age of three, his use of some receptive language before he turns three is very exciting. When he was asked a question, the subject would first repeat the question, pause and then answer it. He did not do this all the time but it showed that there was some receptive language developing. It is also worth mentioning that this subject had received early intervention services, including music therapy, for at least a year.

The number of children being diagnosed with autism is rapidly increasing. Although we have not yet determined what causes this disorder we are discovering many methods of treating and coping with the disorder. Early intervention is a very important program for these children. Although the question of transfer may still be lingering, this study is in agreement with the previous research that shows that music is a valuable tool for the development of language and communication skills in children with autism. In fact the way these children acquire knowledge is determined by their motivation this study can be an example of how motivational music can be used for this population.

It is extremely important to use concrete facts and examples to educate this population. They process information very literally and any abstract materials or concepts will confuse them. Music is used effectively as a reward with children with autism. Once they have had the opportunity to enjoy the process of making music you can use it as a tool for reinforcement.

APPENDIX A

OBSERVATION FORM

Subject #

Group:

Day 1:

Verbal					
Gesture					

Key

0 = No response

1 = Attempted

2 = Accurate

APPENDIX B

SESSION PLANS

Experimental Group

Day 1

1. Hello Song

- Sing hello to the subject to introduce yourself and begin building relationship.
- Allow them to strum the guitar if desired.

2. *Put Your Finger On*

- Movement activity; therapist models movements for subjects.
- Labels body parts and movements, i.e., clapping, turning around.

Lyrics by: Parachute Express

Put your finger on, put your finger on, put your finger on your nose. (4x)

Turn around and clap, clap (4x)

(Repeat using different body parts)

3. *Bubbles, Bubbles*

- Use real bubbles while singing this song to provide a concrete example.
- Encourage subjects to touch, blow, and pop bubbles.

Lyrics by: Lois Birkenshaw-Fleming

Bubbles, bubbles, blow, blow, blow

Bubbles, bubbles, blow, blow, blow

Bubbles, bubbles, up, up, up

Bubbles, bubbles, pop, pop, pop

4. Identify animals

- Use puppets of a cat, dog, and dinosaur to provide concrete examples.
- Use drum to have subjects walk like a dinosaur.
- Use cat puppet with the recorded meow. (This almost always gets their attention however, some subjects are afraid of it so be sure to read the subjects reactions carefully.)
- Sing songs about the noises that the dog and cat make.

5. Sing goodbye song

- Singing goodbye will bring closure to the session and help the subject transition out of the session.
- Allow the subject to strum the guitar if desired.

Experimental Group

Day 2

- Mainly the same as day 1.
- Continue building relationship.
- Begin to leave cues of silence to provide an opportunity for the child to finish singing phrases for you.

1. Hello Song

- Sing hello to the subject to introduce yourself and begin building relationship.
- Allow them to strum the guitar if desired.

2. *Put Your Finger On*

- Movement activity; therapist models movements for subjects
- Labels body parts and movements, i.e., clapping, turning around.

3. *Bubbles, Bubbles*

- Blow bubbles while singing this song.
- Encourage subjects to touch, blow bubbles, and pop bubbles.

4. Identify animals

- Put animals in a bag and have the subject label each one when you pull it out.
- Sing the song for each animal.

5. Sing goodbye song

- Singing goodbye will bring closure to the session and help the subject transition out of the session.
- Allow the subject to strum the guitar if desired.

Experimental Group

Day 3

- Begin to omit words in the songs and have the subject fill them in.
- Elicit labels of objects and movements.
- Only allow them to strum the guitar, play the drum, hold the puppets, and blow bubbles when they respond verbally or gesturally.

1. Hello Song
 - Sing hello to the subject to introduce yourself and begin building relationship.
 - Allow them to strum the guitar if desired.
2. *Put Your Finger On*
 - Movement activity; therapist models movements for subjects
 - Labels body parts and movements, i.e., clapping, turning around.
3. *Bubbles, Bubbles*
 - Blow bubbles while singing this song.
 - Encourage subjects to touch, blow bubbles, and pop bubbles.
4. Identify animals
 - Continue using bag to hide animals.
 - Have the subject label and tell you the noise they make.
5. Sing goodbye song
 - Singing goodbye will bring closure to the session and help the subject transition out of the session.
 - Allow the subject to strum the guitar if desired.

Experimental Group

Day 4

- Omit words in the songs and have the subject fill them in.
 - Elicit labels of objects and movements.
 - Only allow them to strum the guitar, play the drum, hold the puppets, and blow bubbles when they respond verbally or gesturally.
1. Hello Song
 - Sing hello to the subject to introduce yourself and begin building relationship.
 - Allow them to strum the guitar if desired.
 2. *Put Your Finger On*
 - Movement activity; therapist models movements for subjects
 - Labels body parts and movements, i.e., clapping, turning around.
 3. *Bubbles, Bubbles*
 - Have the subject label the bubbles when you pull them out of the bag.
 - Encourage subjects to touch, blow bubbles, and pop bubbles.
 4. Identify animals
 - Continue using bag to hide animals.
 - Have the subject label and tell you the noise they make.

5. Sing goodbye song
 - Singing goodbye will bring closure to the session and help the subject transition out of the session.
 - Allow the subject to strum the guitar if desired only after they have said goodbye.

Experimental Group

Day 5

- Sing only the beginning and small sections of the songs to elicit responses from the subject. (Have them sing as much of the songs as possible.)
 - Let them have control; perform movements while they sing the song.
 - Only allow them to strum the guitar, play the drum, hold the puppets, and blow bubbles when they respond verbally or gesturally.
5. Hello Song
 - Sing hello to the subject to introduce yourself and begin building relationship.
 - Only allow the subject to strum the guitar if they say hello.
 2. *Put Your Finger On*
 - Movement activity; therapist models movements for subjects
 - Labels body parts and movements, i.e., clapping, turning around.
 3. *Bubbles, Bubbles*
 - Blow bubbles while singing this song.
 - Encourage subjects to touch, blow bubbles, and pop bubbles.
 4. Identify animals
 - Continue using bag to hide animals.
 - Have the subject label and tell you the noise they make.
 5. Sing goodbye song
 - Singing goodbye will bring closure to the session and help the subject transition out of the session.
 - Only allow the subject to strum the guitar if they say goodbye.

Control Group

Day 1

1. Hello
 - Greet the subject by waving and saying hello.
 - Give them the opportunity to echo the greeting that you have given them.
2. Movement and Identifying Body Parts

- Ask them to perform the same actions from *Put Your Finger On* without singing. For example “Can you put your finger on your nose”
- Be a model and show them how to perform movements and the location of the body parts mentioned.

3. Bubbles

- Blow bubbles and label pop, blow, bubbles, and up.
- Allow the subjects to play with the bubbles.

4. Identify Animals

- Identify each animal and the noise they make.
- Use the lyrics of the animal songs.
- Do not sing the songs or use the drum.

5. Say Goodbye

- Provide closure for session and help transitioning.

Control Group

Day 2

- Continue building relationship.

1. Hello

- Greet the subject by waving and saying hello.
- Give them the opportunity to echo the greeting that you have given them.
- Ask them to say your name.

2. Movement and Identifying Body Parts

- Ask them to perform the same actions from *Put Your Finger On* without singing. For example “Can you put your finger on your nose”
- Be a model and show them how to perform movements and the location of the body parts mentioned.

3. Bubbles

- Blow bubbles and label pop, blow, bubbles, and up.
- Allow the subjects to play with the bubbles.

4. Identify Animals

- Identify each animal and the noise they make.
- Use the lyrics of the animal songs.
- Do not sing the songs or use the drum.

5. Say Goodbye

- Provide closure for session and help transitioning.

Control Group

Day 3

- Begin to leave cues of silence and encourage the subject to respond.
- Continue modeling for subject.

1. Hello

- Greet the subject by waving and saying hello.
- Give them the opportunity to echo the greeting that you have given them.

2. Movement and Identifying Body Parts

- Ask them to perform the same actions from *Put Your Finger On* without singing. For example “Can you put your finger on your nose?”
- Only be a model and show them how to perform movements and the location of the body parts mentioned if they are not responding.

3. Bubbles

- Blow bubbles and label pop, blow, bubbles, and up.
- Allow the subjects to play with the bubbles.

4. Identify Animals

- Identify each animal and the noise they make.
- Use the lyrics of the animal songs.
- Do not sing the songs or use the drum.

5. Say Goodbye

- Provide closure for session and help transitioning.

Control Group

Day 4

- Begin to leave cues of silence and encourage the subject to respond.
- Decrease modeling for subject.

1. Hello

- Greet the subject by waving and saying hello.
- Give them the opportunity to echo the greeting that you have given them.

2. Movement and Identifying Body Parts
 - Ask them to perform the same actions from *Put Your Finger On* without singing. For example “Can you put your finger on your nose”
 - Be a model and show them how to perform movements and the location of the body parts mentioned.
3. Bubbles
 - Blow bubbles and label pop, blow, bubbles, and up.
 - Allow the subjects to play with the bubbles.
4. Identify Animals
 - Identify each animal and the noise they make.
 - Use the lyrics of the animal songs.
 - Do not sing the songs or use the drum.
5. Say Goodbye
 - Provide closure for session and help transitioning.

Control Group

Day 5

- Leave cues of silence and encourage the subject to respond.
 - Use as little modeling as possible.
 - Use the puppets and bubbles to motivate the subject to respond.
1. Hello
 - Greet the subject by waving and saying hello.
 - Give them the opportunity to echo the greeting that you have given them.
 2. Movement and Identifying Body Parts
 - Ask them to perform the same actions from *Put Your Finger On* without singing. For example “Can you put your finger on your nose”
 - Be a model and show them how to perform movements and the location of the body parts mentioned.
 3. Bubbles
 - Blow bubbles and label pop, blow, bubbles, and up.
 - Allow the subjects to play with the bubbles.
 4. Identify Animals
 - Identify each animal and the noise they make.
 - Use the lyrics of the animal songs.
 - Do not sing the songs or use the drum.
 5. Say Goodbye

APPENDIX C

DATA COLLECTED

Verbal Responses

Experimental:

Subject	Day 1	Day 2	Day 3	Day 4	Day 5
1	49	37	94	114	235
2	23	12	17	37	38
3	290	149	253	462	474
4	43	54	68	34	103
7	5	10	16	28	31

Control:

Subject	Day 1	Day 2	Day 3	Day 4	Day 5
5	7	11	6	0	12
6	0	0	1	0	1
8	173	124	243	83	151
9	32	62	64	66	87
10	12	47	46	50	9

Gestural Responses

Experimental:

Subject	Day 1	Day 2	Day 3	Day 4	Day 5
1	8	8	22	16	16
2	24	18	42	30	48
3	34	54	42	66	52
4	33	37	36	10	12
7	20	16	20	14	18

Control:

Subject	Day 1	Day 2	Day 3	Day 4	Day 5
5	6	8	2	0	2
6	14	4	2	8	10
8	6	8	10	2	24
9	2	10	10	6	4
10	2	15	12	14	10

APPENDIX D

THESIS PROPOSAL

The effect of music vs. nonmusic paired with gestures on spontaneous verbal and nonverbal communication skills of children with Autism between the ages 1-4

Literature Review:

Research has shown how a variety of communication methods can be useful to children with Autism. (Schopler & Mesibov 1985) Simultaneous communication has been used to help these children communicate in a less threatening way. Sign language has been used as a way to supplement limited or non-existent communication in children with Autism. Research has also shown that music activities have been useful in helping these children learn sign language and other nonverbal communication methods. In a study by Edgerton (1994), improvisational techniques were used to improve musical and nonmusical communication of children with autism. Nelson, Anderson, and Gonzalez (1984) described that pairing music with motor activities helped to improve motor coordination. Hollander and Juhrs (1974) found that sign language can be a less threatening means of communication for children with autism. They found that it “enhanced rather than replaced” speech. A study was conducted by Buday (1995) to determine if music promotes better memory for sign and speech imitation. One group received music and signing and the other rhythm and signing. There was a significant difference in the number of verbal and nonverbal, or signed, imitated responses in the group that received music. The purpose of this study is to determine if music paired with gestures will increase both spontaneous verbal and nonverbal communication in children with Autism between the ages 1-4.

Subjects: N=50 (25 music, 25 nonmusic contact control group)

Design:

A Pre-test and Post-test design will be used with the dependent variable being spontaneous gestures and verbal responses. The independent variable will be music vs. nonmusic activities.

Method:

Groups will be randomly assigned into experimental (music) and contact control (no music). Data will be collected during a thirty-minute period for five consecutive days. Sessions will be videotaped and the number of gestures and verbal responses will be recorded. The verbal responses will receive a score of 1 or 2. A score of 2 will be given for an accurate verbal or gestural response and a 1 will be given for an attempted verbal or gestural response (see Data sheet). Pretest will take place during the first session and posttest will take place on the fifth or final session. Music Therapy sessions will consist of 5 songs using gesture and concrete examples for words like dog and bubbles. A cuing system will be used by omitting words in the song and eliciting a response from the subject. The contact control group will participate in same activities without music. The same cuing system will be used.

Results: Statically Analyzed (T- Test)

References:

- Buday, Evelyn. (1995). The effects of signed and spoken words taught with music on sign and speech imitation by children with autism. *Journal of Music Therapy*, 32(3), 189-202.
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- Hollander, F., & Juhrs, P. (1974). Orf-Schulwerk and adaptations for autistic children. *Journal of Music Therapy*, 11(1), 1-12.
- Nelson, D., Anderson, V., & Gonzales, A. (1984). Music Activities as therapy for children with autism and other pervasive developmental disorders. *Journal of Music Therapy*, 21(3), 100-116.
- Schopler, E., & Mesibov, G. (Eds.). (1985). *Communication Problems in Autism*. New York: Plenum Press.

APPENDIX E

PARENTAL CONSENT FORM

I freely and voluntarily and without element of force or coercion, allow my child to be a participant in the research project entitled “Effects of Music and nonmusic paired with gestures to increase communication.”

This research is being conducted by Kimberly Farmer, who is a Graduate Student at Florida State University. I understand the purpose of her research project is to determine if music paired with gestures can increase communication skills in children with Autism between the ages 1-5. I understand that if my child participates in the project that they may be randomly assigned to a contact control group that will not receive music.

I understand that the total time commitment would be a 30-minute session two days a week for three consecutive weeks.

I understand my participation is totally voluntary and I may stop participation at anytime. All data collected on my child will be kept confidential, to the extent allowed by law, and identified by a subject code number. My child’s name will not appear on any of the results. No individual responses will be reported. Only group findings will be reported.

I understand there is a possibility of a minimal level of risk involved if I agree to allow my child to participate in this study. They might experience frustration in sessions when they cannot communicate what they need or want. I am also able to stop my child’s participation at any time I wish.

I understand there are benefits for participating in this research project. My child will receive these services free of charge. Also, my child may develop an increased level of communication. I will be providing valuable information on the communication skills of children with Autism. This knowledge can assist therapists and educators in providing future services that help children with Autism communicate in a more efficient and less threatening way.

I understand that my child will be videotaped by the researcher to ensure accurate data collection. These tapes will be kept by the researcher in a locked filing cabinet. I understand that only the researcher will have access to these tapes and that they will be destroyed by August 8, 2010.

I understand that this consent may be withdrawn at any time without prejudice, penalty or loss of benefits to which I am otherwise entitled. I have been given the right to ask and have answered any inquiry concerning the study. Questions, if any, have been answered to my satisfaction.

I understand that I may contact Kimberly Farmer (770) 312-8741 or the Human Subjects Committee @ Florida State University (850) 644-8673, for answers to questions about this research or my rights. Group results will be sent to me upon my request.

I have read and understand this consent form.

Child’s Name

Date

Parent’s Name

Parent’s Signature

APPENDIX F



Office of the Vice President
for Research
Tallahassee, Florida 32306-7707
(904) 644-7260 • FAX (904) 644-4392

APPROVAL MEMORANDUM
from the Human Subjects Committee

Date: May 21, 2003

From: David Quadagno, Chair *DQJ/qc*

To: *Kimberly Farmer*
2306 Riverview Place
Jacksboro, GA 30238

Dept: Music Therapy

Re: Use of Human Subjects in Research

Project entitled: the Effect of Music vs. Nonmusic Paired with Gestures on Spontaneous Verbal and Nonverbal Communication Skills of Children with Autism Between the Ages 1-4

The forms that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Human Subjects Committee at its meeting on May 14, 2003. Your project was approved by the Committee.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals which may be required.

If the project has not been completed by **May 15, 2004**, you must request renewed approval for continuation of the project.

You are advised that any change in protocol in the project must be approved by the members of the committee for approval. Also, the principal investigator must promptly report in writing any unexpected problems causing risks to research subjects or others.

By copy of this memorandum, the director of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department and should review portions of such investigations as they may relate to insure that the projects being conducted in compliance with our institution and with all federal regulations.

This institution has an Assurance on File with the Office for Protection from Research Risks. The Assurance Number is: H02000040.

APPLICATION NO. 03-074
Cory Stanley

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BIOGRAPHICAL SKETCH

The author, Kimberly Farmer, was born in Slidell, Louisiana. She was born on July 11, 1978. She attended The State University of West Georgia from 1996-2000 where she received her Bachelor of Music in Music Education. She began her Master's Degree in Music Therapy at Florida State University in 2001. After completing a seven-month internship in Clayton County Public Schools she accepted a job at Music Therapy Services of Greater Atlanta. She now holds a Master of Music degree in Music Therapy and is a board certified Music Therapist.