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THE EFFECT OF MUSICAL SOCIAL STORIES™ ON TARGET BEHAVIORS OF PRESCHOOL CHILREN WITH AUTSIM SPECTRUM DISORDERS: THREE CASE STUDIES

By

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ABSTRACT

THE EFFECT OF MUSICAL SOCIAL STORIES™ ON TARGET BEHAVIORS OF PRESCHOOL CHILDREN WITH AUTSIM SPECTRUM DISORDERS: THREE CASE STUDIES

By

Denise Anne Travis

The purpose of this research is to examine the effect of Social Stories™, set to original music, on target behaviors of preschool children with Autism Spectrum Disorders (ASD). Social Stories™ and music have individually been shown to be effective teaching tools for elementary and preschool children with ASD, aiding in ability to focus and recall information. Social Stories™ set to music make a logical pairing. Musical Social Stories™ have proven successful for elementary age children. This research expands the current field of study to include preschool children, as indicated by early intervention protocols. Three children with primary diagnoses of ASD participated in the study. Musical Social Stories™ were written, using original music, administered and compared to pre- and post-test baselines. *T*-tests revealed a significant change in two target behaviors, and approached significance in two target behaviors between the three participants. Graphic representation of the data reveals a trend toward increased positive behavior and decreased negative behavior during the musical Social Story™ intervention overall for all three participants. Examination of the anecdotal information collected suggests a clinical or practical significance demonstrating the efficacy of musical Social Stories™ for all three preschool children. The researcher discusses importance of clinical significance, subtleties of participant changes, limitations due to the sample size, merits of original vs. pre-composed music, effects of reading level, and possibilities of at-home application.

Joshua, Nathan and Lucas, I hope you learn to like homework as much as I do.

Mom, thanks for keeping the t.v. off and my curiosity on.

Dad, thanks for asking me "What's your plan?"

Jack, thanks for catching the ball.

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Introduction and Literature Review

The Centers for Disease Control and Prevention report that as many as 2 to 6 in 1,000 persons in the United States are diagnosed with autism or related disorders (2001). The incidence is higher in some states. The estimated autism rate for children in Michigan is as high as 1 in 63. School districts are seeing a phenomenal increase in autism enrollment. In the United States during the 2000-2001 school year 94,339 children with autism received services under the Individuals with Disabilities Education Act (IDEA). Fifteen thousand five hundred ninety of those were in preschool classrooms (U.S. Department of Education, 2002). When first tracked in 1984, there were 304 students with autism reported to attend Michigan public schools. There were 7525 children with autism enrolled in 2003, a 14% increase from the previous year (Nuttall, 2004). This trend is a result of increased autism rates and the 1997 implementation of IDEA, which assures a free appropriate public education for special needs individuals. ". . . The practice of inclusion in the public schools has created a new demand for the production of innovative techniques and interventions for students with autism" (Brownell, 2002, p.117). The 2004 revision of IDEA requires schools to produce measures of greater accountability. Increased accountability means finding easily implemented methods that produce observable results. Social Stories™ are proving to be one such method of instruction.

Social Stories™

Gray & Garand (1993), Gray (2000a, 2000b), Atwood (2000), Rowe (1999) and DelValle, McEachern & Chambers (2001) advocate the use of Social Stories™ as an effective teaching method for children with Autistic Spectrum Disorders. Gray developed Social Stories™ in 1991 as a method of teaching social information to children with autism from their perspective. Developed originally for elementary age children with ASD, Social Stories™ have been shown to also be beneficial across ages, and disabilities, including individuals who are 'normally developing.' "Social stories are based on the rationale that if a student's ability to gain information about his or her environment is impaired, that information should be presented in a format he or she may be able to understand" (Gray & Garand, 1993, p. 9). The result of Social Story™ use is often an improvement in understanding on both sides of the social equation.

A Social Story™ is a short story carefully crafted according to specific guidelines to convey accurate information of the who, what, when, where, and why of a situation, concept, or social skill. The child's needs determine the topic of the story, while the child's perspective determines the focus of the story. The story is written in the first person, as if the child is telling the story. The Social Story™ uses positive language and states desired responses positively. If a reference to a negative behavior is essential to the story, it is mentioned carefully and in general terms (i.e., "Sometime people make mistakes"). Sometimes alternative vocabulary must be used to avoid terms that might elicit anxiety. "Another" might be used in place of "different." "Replace" might be used in place of "change." "Better" or "another" might be preferable to "new." The Social Story™ must be literally accurate. The uses of "usually" and "sometimes" are examples

of words that insure the literal translation of the material presented. Drawing from the same rationale, the use of "I will try. . ." is preferred over "I will" statements.

Social Stories™ use four basic types of sentences. Descriptive sentences are accurate, assumption-free statements of fact that answer the who, what, when, where and why questions of a situation. They are used to bring logic and accuracy to the story. Descriptive sentences are used most frequently, making up the backbone of the story. Some Social Stories™ may contain only descriptive sentences. Perspective sentences describe a person's thoughts, feelings, beliefs, or motivations. Most of the time they are used to express the thoughts and feelings of other people. Affirmative sentences enhance the meaning of surrounding statements and may express a commonly shared opinion. They stress important points, refer to rules, and reassure the reader (i.e., "This is a good idea." "This is ok." "This is a safe thing to do."). The purpose of directive statements is to identity a possible response from the reader, or to gently direct behavior. Gray outlines use for two additional sentence types (2000a). Control sentences are statements written by the student with ASD to help identify recall strategies and apply information. Cooperative sentences identify what others will do to help the student. Gray created "the complete Social Story™ ratio" to apply to the story as a whole. The focus of the story is to describe more than direct; 0-1 directive or control sentences are used for every 2-5 descriptive, perspective, affirmative, or cooperative sentences.

The construction of a Social Story™ uses concrete, easy to understand text enhanced by visual supports. The text and illustrations should reflect the student's reading skills, attention span and cognitive ability. Pictures, maps, photos or symbols used as illustrations are printed in black and white to reduce distraction and limit any

unintentional relay of misinformation. The Social Story™ is printed in black ink, on white paper, in a clear font, sized according to the student's reading level. Most Social Stories™ have only one or two sentences per page. The pages are then matted on black construction paper and bound with a title page. Gray recommends "teaching with the title" of a Social Story™. The title concisely states the purpose or content of the story, reinforcing the most important information presented in the story.

The Social Story™ book is presented to the child at an appropriate time, often immediately prior to the situation or event described in the story. Gray suggests the "Jiminy Cricket" approach (2000a). The author sits beside and slightly behind the child to remove herself from the child's view, and makes the story the joint focus of the author and child. The author reads the story with a gentle, friendly tone, matching the reassuring quality of the text. As the child learns, or as new situations arise, the Social Story™ may be faded or rewritten to address the new awareness of the child. The goal of Social Stories™ is not to change behavior, though that is often the result. The goal of a Social Story™ is to improve an individual's understanding of events and expectations. This improved understanding often leads to responses that are more effective from the individual for whom the Social Story™ is written.

Social Story™ Literature

Anecdotal evidence relays the adaptability of Social Stories™ to multiple uses. Gray and Garand (1993) give the first accounts of Social Stories™ in practice. Use of a Social Story™ allowed a 9-year-old girl with autism to ride quietly in the car, without the hitting and scratching of others that she exhibited previously. After one reading of a Social Story™, a 6-year-old boy with autism began performing the morning school

routine that had previously been problematic for him. The family of the same child was able to use a Social Story™ to teach the child to reduce mistreatment of the family cat. The teacher of a 7-year-old girl with autism was able to teach the child appropriate means of expressing anger, reducing self-abusive behavior, using Social Stories™ where positive reinforcement and behavior management techniques had failed. A member of a high school choir who had autism learned to control his singing volume at an appropriate level with review of a Social Story™. Adding to the anecdotal evidence, Chapman (2000) describes the use of a Social Story™ to help a 14-year-old boy with autism reduce his anxiety during a camping trip. Rowe (1999) wrote an account of an elementary school student who was able to eat his lunch peacefully in the lunchroom thanks to a Social Story™ that explained the behavior of other children during lunchtime and what behaviors were expected of him.

Empirical research regarding the efficacy of Social Stories™ for children with autism spectrum disorders is limited but growing. Many of the studies examine Social Stories™ in combination with other methods, furthering the documentation of the adaptability of the Social Story™. One such study was the first to examine Social Story™ use empirically. Swaggart, Gagnon, Bock, Earles, Quinn, Myles, et al. (1995) investigated social story use together with a traditional social-skill intervention model on the target behaviors of three elementary students with autism. The researchers designed the intervention procedures to decrease negative behaviors (e.g., aggression) and increase positive outcomes (e.g., positive greeting behaviors). The findings for subject one showed a decrease in aggressive behavior and an increase in appropriate greeting skills. Analysis of subject two's results revealed a decrease in aggressive behavior, a decrease in

screaming, an increase in parallel play, and an increase in appropriate sharing. The results were similar for subject three: an increase in parallel play, an increase in spontaneous sharing, and a decrease in grabbing toys from others.

Gray notes the importance of proper construction of Social Stories™ to assure that the story is accurate in the information relayed to the student (2000b). One of the limitations seen in the literature is the use of Social Stories™ that are not properly constructed. Scattone, Wilczynski, Edwards, & Rabian (2002) is one of the few studies in the literature that examined the effectiveness of properly constructed Social Stories™ to target disruptive behaviors of three children with autism, ages 7 through 15. Each child received an individualized Social Story™ program following the Social Stories™ guidelines. Each child reduced the incidence of target behaviors markedly. Analysis of the data for the subjects showed a decrease in the first subject's chair tipping (50% to 4.6%), a decrease the second subject's inappropriate staring (66% to 18.3%) and a decrease in the third subject's shouting (16% to 5.1%) when compared to baselines. Kuttler, Myles, & Carlson (1998) also used Gray's guidelines for constructing Social Stories™ to reduce the occurrence of pre-tantrum behaviors for a 12-year-old boy with autism (Gray, 1994; Gray & Garand, 1993). The occurrence of pre-tantrum behaviors decreased to zero during repeated treatment conditions, with a return to near baseline during removal of the treatment.

The intent of Social Story™ use is not to focus solely on reducing negative behaviors but on teaching social information surrounding a particular situation, thus increasing the likelihood of desired outcomes (Gray, 2000b). Barry and Burlew (2004) chose to examine Social Story™ implementation with the intent of increasing choice

making and play skills in an Exceptional Student Education classroom for two children, ages 7 and 8, with severe autism. This study used a series of three Social Stories™ using pictures of the children whenever possible to explain choice making and appropriate peer interaction in free-play time. Both students gained in ability to make independent choices and appropriate play during free time, and one student increased in ability to play appropriately with peers. This study is important, not only in its focus on reinforcing positive outcomes, but also in its Social Story™ success with children who have a diagnosis of severe autism.

Lorimer (1999) investigated the portability of Social Stories™ procedures. She looked at the use of a social story program in a home setting for a 5-year-old boy with autism. Following an ABAB design (where A represents baseline, and B represents treatment), she used two Social Stories™ to decrease interrupting verbalizations, seen as precursors to tantrum behavior. The researcher found a decrease in precursors and tantrum behaviors during each Social Story™ treatment period. The precursors and tantrums increased during the return to baseline (Social Stories™ removed). Analysis of the data found precursor behaviors reduced to zero on two days of the final treatment period, and tantrums reduced to zero on all but one day of each Social Story™ treatment phase. Lorimer also found that incorporation of other interventions into the text of the Social Story™ helped increase the effectiveness of those previously unsuccessful interventions after the Social Stories™ treatment. The subject gained an understanding of the use and importance of clocks and mini-schedules. This supports Gray's contention that a Social Story™ presents a situation in a manner that makes sense to an individual with autism spectrum disorder (Gray, 2000a, 2000b).

The portability of Socials Stories™ across treatment modalities and the ease of their implementation are assets of their use. Effectiveness of Social Stories™ training is also of interest. Agosta (2004) formed a teacher-researcher partnership that examined Social Story™ use. The researcher and a special education teacher collaborated to determine the best course of action to reduce interruptive behaviors of a 6-year-old boy with autism. The teacher-researcher team designed a Social Story™ intervention, with the teacher responsible for implementation. The treatment successfully reduced the target behaviors of screaming, yelling, crying, and loud humming exhibited by the student during group activities. Agosta's study gives evidence for the ease of developing and implementing a Social Stories™ intervention by a teacher who had not previously used them.

Moudry (2002) also investigated the efficacy of Social Stories™ training. The researcher implemented a Social Stories™ training program for paraprofessionals using Gray's "Writing Social Stories" video presentation and accompanying workbook. The paraprofessionals learned to effectively use and evaluate Social Stories™. These Social Stories™ had a positive effect on target behaviors of the ASD students paired with the paraprofessionals. This study demonstrates both the ease of use and the effectiveness of training using this video workshop as a Social Story™ training tool.

The Autism Society of America (Autism Society of America Panel of Professional Advisors, 2000) and the National Institute of National Health (Strock, 2004) recognize the importance of early intervention for children with ASD. The ASA "supports an individualized approach that addresses the core deficits of autism spectrum disorders," including social skills deficits (ASAPPA, 2000). Despite this

recommendation, the research on Social Stories™ in preschool settings is just beginning to emerge. A study of three children by a teacher in a New Jersey preschool demonstrates the efficacy of Social Stories™ to increase positive behaviors in three preschool children with autism (Wiesen, 1999). Wiesen found a 40% increase in subject one's getting someone's attention appropriately over 33 days with the Social Story™ read to the subject daily. The treatment plan for subject two included fading the story. Review of data for subject two revealed a 20% increase over 15 days when the Social Story™ was read to the subject daily, an additional 4% increase over 5 days when the Social Story™ was read to the subject every other day, and an additional 7 % increase over 8 days when the Social Story™ was read to the subject every third day, for a total of a 33% mean increase over the entire treatment period totaling 28 days when compared to baseline. The third subject's results revealed an increase of a mean of 11% in hand raising in the lunchroom to get appropriate attention. The Social Story™ was read to the subject daily, for 19 days, in the classroom prior to the lunch period. Subject one showed zero incidence of hand raising for the first 13 days of this portion of the intervention, and a mean of 32% increase for the last 6 days of this period. During the second phase of subject three's intervention, the subject reviewed the Social Story™ in the kitchen daily immediately prior to the subject receiving his lunch. The mean increase in hand raising was 82% over baseline over the 12 days of this phase. During the third phase, a return to the first condition showed a decrease in hand raising of 18% from the second phase, retaining a 64% increase from baseline. The findings for subject three suggest that timing and location of the Social Story™ intervention may play a key factor in their effectiveness. Wiesen's findings are remarkable in showing the efficacy of Social

Stories™ over a longer treatment period than most research allows. Social Stories™ often have an immediate dramatic affect for the reader. Wiesen's findings suggest that longer treatment periods may to necessary to achieve desired results. The findings of Wiesen's study also support the use of Social Stories™ with younger children.

In a study of 5 subjects: two kindergarteners, one second-grader and two middle school students with ASD, Delano (2003) found the greatest gains, and generalization of gains, in duration of social engagement for the two kindergarteners. Delano's findings add to the body of evidence supporting early intervention for individuals with ASD.

Autism and Music

Many children on the autism spectrum display an interest in music. Leo Kanner noted this interest in the first diagnostic description of the disorder in 1943 (Kanner, 1943). The American Music Therapy Association (2002) lists these features of music for use with children with autism spectrum disorder:

- People with diagnoses on the autism spectrum often show a heightened interest and response to music, making it an excellent therapeutic tool to work with them.
- Music is a very basic human response, spanning all degrees of ability/disability. Music therapists are able to meet clients at their own levels and allow them to grow from there. The malleability of music makes it a medium that can be adapted to meet the needs of each individual.
- Music is motivating and enjoyable.
- Music therapy addresses multiple developmental issues simultaneously.
- Music therapy can provide success-oriented opportunities for achievement and mastery.

- The structure and sensory input inherent in music help to establish response and role expectations, positive interactions, and organization.
- Music captures and helps maintain attention. It is highly motivating and engaging and may be used as a natural "reinforcer" for desired responses. Music therapy can stimulate clients to reduce negative and/or self-stimulatory responses and increase participation in more appropriate and socially acceptable ways.
- Because music is processed in both hemispheres of the brain, music can stimulate cognitive functioning and may be used for remediation of some speech/language skills.

Early intervention strategies often employ music. Wimpory, Chadwick, & Nash (1995) report the successful use of a music intervention for a preschool child with autism. The researchers found that musically accompanied child-led games and interactions increased social acknowledgement, eye contact, and initiation of interactive involvement for a 3-year-old with autism, and a 2-year follow-up showed positive changes had been sustained.

Humpal (1991) also examined music effect on preschool children. Subjects of this study participated in an integrated early childhood music program designed to increase interaction between special needs children and typical peers. Fifteen neurotypical children age 4, and twelve children with special needs, ages 3 to 5, met at a preschool for music sessions. After 15 weekly sessions, the researchers found that the program had facilitated peer interaction and fostered acceptance of differences.

Music may assist in the recall of information. Songs act as "mnemonic" devices to aid in memory of new or difficult concepts. Musical presentation also provides an optimal learning environment for those students who are highly attentive to music activities but are often distractible using other modalities. The ability to learn and recall information can only occur when a person is motivated and attending. Buday's (1995) study capitalized on music's ability to focus attention and aid in recall. She examined the ability to learn and recall signed and spoken words in ten children with autism, when taught through speech or music. Seven words were set to a musical verse, and seven were set to a rhythmic verse not set to music. Buday found subjects correctly imitated more signs during the music sessions, and recalled more spoken words the day after the session if the words had been introduced in the musical verse. Buday reported that subjects displayed less self-stimulatory behavior during the music sessions, and seemed to enjoy the music sessions more than the rhythm sessions.

The Autism Society of America (ASA) lists music therapy as a complimentary approach for the treatment of autism. "While early educational intervention is key to improving the lives of individuals with autism, some parents and professionals believe that other treatment approaches may play an important role in improving communications skills and reducing behavioral symptoms associated with autism. These complementary therapies may include music, art or animal therapy and may be done on an individual basis or integrated into an educational program. All of them can help by increasing communication skills, developing social interaction, and providing a sense of accomplishment. They can provide a non-threatening way for a child with autism to develop a positive relationship with a therapist in a safe environment" (Autism Society of

America, 2006). The ASA goes on to state: "Art and music are particularly useful in sensory integration, providing tactile, visual and auditory stimulation. Music therapy is good for speech development and language comprehension. Songs can be used to teach language and increase the ability to put words together."

Summary

The anecdotal evidence of Gray and Garand (1993), Chapman (2000) and Rowe (1999) give vivid accounts of the success of Social Stories™ for children with autism spectrum disorders. Swaggart et al. (1995) give evidence of Social Stories™ paired with other complementary methodologies to increase desired outcomes. Scattone (2002) and Kuttler, Myles, & Carlson (1998) advocate strictly following Social Story™ guidelines, while Lorimer (1999) shows the necessity to take the child's perspective. The findings of Barry & Burlew (2004) demonstrate the use of Social Stories™ to increase positive outcomes, often replacing negative actions. Wiesen (1999) and Delano (2003) support the use of Social Stories™ with preschool aged children with ASD. Consideration of these findings leads this researcher to a Social Story™ implementation: (a) for children with ASD, (b) following Gray's Social Story™ guidelines (Gray, 2000b), (c) with a focus on the child's perspective, (d) encouraging positive outcomes, (e) for preschool aged children.

The findings of Wimpory, Chadwick, & Nash (1995), Humpal (1991), Buday (1995), and the insight provided by the ASA (2004) and this researcher's personal experience with special needs populations, particularly autism spectrum disorders, provide the rationale for inclusion of music in a Social Story™ presentation.

Statement of Purpose

With the intent of improving music therapy practice and education strategies for special needs populations, the purpose of this research is to examine the effect of musical presentations of Social Stories™ on target behaviors of preschool children with Autism Spectrum Disorders (ASD). The problem of this study is to examine the occurrences of target behaviors before, during, and after the music therapy treatment period in order to evaluate the effectiveness of the treatment.

CHAPTER TWO

Review of Related Research

To date, three studies have examined the efficacy of music in combination with Social Stories™ or narratives on target behaviors of children with Autism Spectrum Disorders (Brownell, 2002; Pasaili, 2004; Pudenz, 2004). These studies are the focus of this review.

Brownell (2002) looked at "musically adapted Social Stories™" and their effects on four children with ASD. The subjects of the study were first and second grade students in an eastern Iowa elementary school with a primary diagnosis of autism. Referrals from teachers provided the basis for choosing subjects. Brownell screened the subjects for previous positive responses to music therapy or general music to exclude those that might have negative reactions to auditory stimuli. The subjects chosen for the study were four males between the ages of 6 and 9 in either first or second grade. Each of the subjects possessed expressive verbal skills and a minimum of pre-reading skills, and attended part of the school day in a self-contained classroom by grade, with other children with ASD. None of the subjects had used social stories for the target behaviors chosen as the focus of this study. Using a ten-step procedure as outlined by Swaggart et al. (1995), Brownell created and implemented a Social Story™ program as the research method. Target behaviors considered most important to social and academic goals and best suited for Social Story™ interventions were determined for each subject in consultation with the children's teachers. Data collection occurred at the time teachers indicated the target behavior most likely to occur. Brownell minimized learning order effects by using an

ABAC/ACAB counterbalancing of treatment order design. A represents baseline, B represents traditional Social Story™ treatment, and C represents musically adapted Social Story™ treatment. Each condition lasted for one school week. The student's classroom teacher or paraprofessional collected baseline data on a form designed by the researcher, specific to each student that included a written operational definition of the target behavior. Brownell wrote a traditional Social Story™ for each student using the prescribed Social Story™ ratio (Gray, 1997) paired with appropriate illustrations, printed, and mounted in black and white as Gray suggests (Gray, 1994). Each Social Story™ was then set to original music by the researcher. During the treatment condition, the researcher either read or sung the Social Story™ to the student, in seclusion to reduce distraction, immediately before the data collection period. After the first treatment phase, Brownell repeated the entire procedure, alternating treatment of the subjects. The researcher collected interobserver reliability data for two days of each condition for each subject. Interobserver reliability for each student ranged from .86 to .93. For subjects I, II and IV, Brownell found a significant difference in the effectiveness of the treatments on the target behavior between both the reading presentations and music presentations respective to their baselines. Comparison between the two-treatment conditions approached significance. The music condition proved at least as effective as the reading condition statistically. However, there were fewer instances of the target behavior during the music condition overall. Subject III showed a significant reduction in target behaviors during both sung and read Social Story™ presentations. In addition, the sung presentation was found to be significantly more effective than the read Social Story™.

Brownell found that implementation of both traditional and musical forms of Social Stories™ produced successful reduction in target behaviors in all eight-treatment conditions. Further, the frequency of target behaviors was consistently lower in the music condition than the read condition, regardless of the counterbalancing of treatment order, extinguishing to zero during one observation for one subject. Brownell's subject selection is sound. The current study will replicate these criteria for subject selection where appropriate. Brownell used Swaggart's ten-step outline for writing and implementing a Social Story™ (Swaggart et al. 1995). While these steps are similar to recommendations made by Gray (1994), Gray has since revised her Social Story™ guidelines (Gray 2000a, 2000b). These revisions were not available to Brownell at the time of his study, and Swaggart's procedure was the best fit at the time. Today's literature changes the perspective of Brownell's methodology. For this reason, the current research did not use Swaggart's outline, but followed Gray's revised guideline.

Pasiali (2004) followed Brownell's conclusionary suggestion of researching Social Story™ presentations using familiar music ("piggybacking"). In a musical application of Lorimer's (1999) study, Pasiali examined the effectiveness of "prescriptive therapeutic songs" in a home environment on problematic behaviors of children with autism. Three children, boys ages 7 and 9 and a girl age 8, with ASD ranging from high functioning to mildly impaired were subjects of this study. Pasiali obtained subjects through newspaper advertising, a local advocacy group, and an on-line autism list server. None of the subjects were hearing impaired, and none had previously received music therapy to address the identified target behaviors of this study. Through phone consultation, the researcher asked the parents to identify a problematic behavior

occurring in the home for use as the target behavior of the study. She also asked the parents to name some of the child's favorite songs. Pasiali then composed a "prescriptive therapeutic song" for each child by setting the adapted lyrics to one of the songs listed by the parents. Pasiali used an ABAB reversal design, where A represents baseline, and B represents treatment. Each condition lasted 7 consecutive days. One parent acted as observer responsible for data collection and the other parent or a paraprofessional was responsible for inter-observer reliability data collection. Inter-observer reliability ranged from 92 to 99 percent. Observers recorded the incidence of target behaviors for each condition on a form designed by the researcher that included the operational definition of the behavior on the top of the form. The length of data collection varied from subject to subject dependent on the behavior targeted, and the situation surrounding its occurrence. Data collection was 30 minutes for two subjects and one hour for the third. After the initial baseline phase, Pasiali conducted a 15-minute music therapy session with each individual child immediately prior to the determined data collection time. She used a visual schedule (icon board) to provide a cue for the structure of the session. At the end of each segment, the therapist asked the subject to remove the corresponding icon from the session schedule. The session consisted of three music therapy applications incorporating the prescriptive therapeutic song. First, she instructed the subject to listen to the song as she sang and accompanied it on guitar. Second, she asked the subject to play either maracas or egg shakers while she sang the song, playing the guitar. Third, giving a lyric sheet to the subject, she invited the child to sing the song with her. Following guidelines for writing Social Stories™ (Gray & Garand, 1993; Swaggart et al.,

1995), she printed the lyrics in black print on white paper to limit distraction and increase ease of reading.

T-tests for subject I showed significant decrease in problematic behavior between baseline A1 and treatment B1, but combined baseline compared to combined treatment did not reach significance. Subject II's scores did show a significant decrease in problematic behavior both in comparison of A1 and B1 and combined baseline compared to combined treatment. Subject III's *t*-test analysis did not reveal significance in any comparison. Visual analysis of the results shows fault in the criterion measures chosen. Pasiali did not find statistical significance for subject III; yet, clinical significance is shown through extinction of the problematic behavior on five of the seven days of the final treatment. The graphed results show the use of prescriptive therapeutic songs was successful in reducing the measured behavior of each child during the first treatment phase.

Pasiali's treatment protocol encourages auditory, visual, and kinesthetic responses from the subjects, possibly increasing alertness. Gray's guidelines include encouraging the children to read the story for themselves if the child is developmentally able to do so (Gray, 2000b). Pasiali's encouraging the child to sing the adapted lyrics with her while reading the lyric sheet is the musical application of this guideline. The current study used this portion of Pasiali's treatment protocol.

The purpose of Pasiali's ABAB design is to examine initial baseline measure, treatment measure, a second baseline to determine if treatment is the affecting variable, and then a return to treatment to reexamine its effect. The criterion and analysis of this design were poor choices for this study. Empirical and anecdotal evidence suggest Social

Story™ interventions often have dramatic, quick acting effects. In this instance, one should expect baseline A2 to be lower than A1, and treatment B2 to be lower than its corresponding baseline. This decreases possibility of finding significance in the second treatment when compared to its baseline. The better comparison would be from treatment B2 to the original baseline A1. Pasiali did not evaluate the overall effect of combined treatment sessions. This evaluation would have been the most practically useful. Pasiali's study proves this ABAB design to be ineffective in measuring the practical outcome; therefore, the current study did not replicate it. The current study removed the repeat of the treatment measure, using an ABA design.

Pudenz (2004) more closely followed Brownell's suggestion of researching "piggybacked" musical presentations of Social Stories™. She used his ABAC/ACAB reversal design, and followed his methodology of treatment including subject selection criteria and classroom setting, except Brownell used original music and Pudenz set the adapted lyrics to the children's favorite childhood tunes. She makes note of her careful application of story guidelines (Gray, 2000a) and her having chosen her lyrics with care to present accurately the desired material without changing normal accents of words. The subjects of the study were four children, ages 6 to 12, with primary diagnoses of autism. The target behavior for subject one was number of touches, as too frequent touching was a problem behavior. *T*-tests comparing the first baseline to the reading condition and the second baseline to the sung conditions showed no significant differences. Visual analysis of the data for subject one shows a greater decrease in touching during the sung Social Story™ versus the read story. Subject two's target behavior was following directions. The number of directional repetitions required before the subject responded measured

this. Comparison of the music condition to its baseline showed a significant difference in reduction of directional repetitions required, while a comparison of the spoken story to its baseline did not reach significance. No significant difference was found between the two treatments. The researcher measured the frequency of interruptions for subject three. Subject three's results showed no significant difference in reduction of interruptions for the reading condition, while the music condition showed significance. No significant difference was found between the two conditions. Subject four's habit of talking to himself was the identified target behavior. A *t*-test comparison of the first baseline and the music condition produced a significant difference. The difference between the second baseline and the reading condition did not show significance. A final comparison of the music and reading conditions showed a significant difference.

Pudenz found a significant reduction in target behaviors for three of the four subjects during the music condition, and none during the read condition. This seems contradictory to the Social Story™ evidence cited in Chapter One. Pudenz's study seems to suggest a musical presentation of a Social Story™ may be effective for a student when traditionally spoken presentations of the same story were not. A student that does not respond to the information in a read Social Story™, might accept the same information if it is sung.

Pudenz's study confirms the successful use of musically presented Social Stories™ in addressing target behavior. Despite her care in following Social Story™ guidelines in writing her stories, setting them to piggybacked or familiar pre-composed music forces change in sentence structure to accommodate rhythm, meter, and verse length. While a familiar tune might help recall, the necessity to make the words fit the

tune might limit the presentation of the information conveyed. The current study used original music to allow the Social Story™ presentation to resemble Gray's guidelines as closely possible. In order to make the music as appealing to the children as possible, the researcher considered musical tastes when composing the music for the Social Story™ presentation.

All of the studies outlined in this chapter have looked at musical Social Stories™ or narratives with school age children. Evidence suggests that early intervention is dramatically successful in helping individuals with autism reach their full potential. In her writings on Social Stories™, Gray suggests that a minimum of pre-reading skills is essential for Social Story success (1997, 2000a, 2000b). Despite this suggestion, she has accounted Social Story™ success with preschool children (2000b). The current research examined the use of musically presented Social Stories™ on target behaviors of preschool children with Autism Spectrum Disorders.

CHAPTER THREE

Method

Selection of Participants

The children selected for this study came from an Early Childhood Special Education (ECSE) classrooms in the Greater Lansing Area in Michigan, specifically in Holt, Michigan. The chosen sample was reflective of the school's rich diversity in the areas of culture, economic status, and family education. Two boys and one girl were selected as participants for this study. The researcher notified ECSE teachers and support staff of the study four months prior to the beginning of the data collection period. For the purpose of this study, the term support staff will refer to all professionals that help with the needs of the child, including, but not limited to, parents, speech therapists, occupational therapists, physical therapists, music therapists, paraprofessionals, assistant teachers, student teachers, social workers, school psychologists and autism specialists. The researcher sought referrals from teachers and support staff to obtain participants for the study.

Criteria for Selection of Participants

Diagnosis of ASD: This study was designed to evaluate musical Social Story™ interventions for preschool age students with Autism Spectrum Disorders. In order to remain as close to the original Social Story™ intended audience, only students with a diagnosis of ASD participated.

Targeted behavior: Target behaviors were defined on an individual basis. The behaviors were determined as areas of need as seen by the teacher, support staff, parents,

or as indicated in the child's Individualized Education Plan (IEP). Each target behavior was operationally defined in terms of specific observable behaviors suitable for music Social Story™ intervention.

Previous positive reaction to general music or music therapy activities: Some auditory stimuli can be painful or disturbing for individuals with ASD. To avoid unnecessarily causing adverse reactions in those with such sensitivity, the researcher screened potential participants. Since some individuals may have hidden or unknown sensitivities, previous positive music experience was required for acceptance as a participant of this study.

Procedure

The following outline of procedure was repeated for each child individually. Once a participant was accepted to the study, the researcher contacted the child's parents to obtain written consent for participation and to obtain information on the child's music preferences. The researcher talked with all support staff working with the child, and observed the class for two days to determine the behavior(s) to be targeted, and the time of the greatest occurrence (or lack of occurrence) of this behavior. The researcher operationally defined each target behavior for purposes of data collection. The study consisted of three phases over a three-week period. During the first week, the researcher, as primary observer, recorded daily the incidence of the target behavior (during a one half hour interval) on a data collection sheet created for this purpose at the determined time of greatest occurrence (see Appendix A). Week 1 was used as a baseline. The researcher also used week 1 to further observe the nature of the target behavior and the situation or events surrounding the time selected for data collection. This information provided the

basis for the Social Story™. In preparation for the second phase, the researcher wrote a Social Story™ for each individual child following Gray's guidelines (2000b). Pictures of objects and places mentioned in the story were used where appropriate (see Appendix B). This story was then set to original music using the child's musical style preferences (as indicated by parental and staff report and observations of the researcher) when applicable (see Appendix C). During the second week (phase two), the researcher presented the musical Social Story™ daily, just prior to the time of greatest occurrence (i.e., before circle time or at the beginning of free choice). Each student used a schedule board with activity tabs that were secured with Velcro. The students checked their schedules prior to each activity daily to assist them with the transition between activities. A tab labeled "Music Story" was included in the children's daily schedule at the appropriate time to help establish this activity as a part of the school day. The student received the musical Social Story™ presentation in partial seclusion to limit distractions. The researcher first sang the musical Social Story™ while accompanying on guitar for participants one and two, accapella for participant three, then she invited the student to sing with her using the Social Storybook™ as a lyric sheet. The measurement period immediately followed. This half hour data collection was at the same time as during week one. The treatment was withdrawn the third week, and the behavior was recorded at the same time for the half-hour interval. Exceptions to this schedule are outlined in the individual case studies. The Social Story™ book was available to the child in the classroom throughout the day to review if the child wished, as is recommended by Gray (2000b). One of the child's support team collected interobserver reliability data on two days of each of the treatment

conditions. Interobserver reliability was 93%. The support staff and the researcher also made notes on the collection sheets to add anecdotal data.

Definition of Research Questions

With collaboration from the classroom staff and treatment team for the participants, the researcher developed the following research questions:

1) Ben - What effect will the musical Social Story™ have on the target behavior of independent initiation of activities, as evidenced by occurrences of:
    a. Appropriate play
    b. Disruptive/Inappropriate Behaviors
    c. Seeking Help
2) Emily - What effect will the musical Social Story™ have on the target behavior of taking toys from others, as evidenced by occurrences of:
    a. Taking without asking
    b. Asking for desired object
3) Aaron - What effect will the musical Social Story™ have on the target behavior of remaining at circle time, as evidenced by occurrences of:
    a. Trying to leave circle

Measurements and Analysis

After the collection of data, a series of dependent sample *t*-tests were performed to answer the research question for each target behavior. The researcher prepared graphic representations of each student's resulting data for the purpose of visual analysis. Case studies describe the specific details of methodology and results case by case for each participant. The names of participants and staff that participated in this study have been changed to protect their identity.

CHAPTER FOUR

Case Studies: Results and Reactions

Case Study - Ben

A whirling-dervish, a Tasmanian devil, Stitch (of Disney's Lilo and Stitch) - a little boy with messy brown hair and mischievous smile. Aren't they all one and the same? Ben sure is a hand full, and full of energy. He has already plowed his way through the morning routine and dove into rough and tumble "play." He insists on going without a shirt. He just wanders from place to place, leaving destruction in his wake, chatting all the while. My, what a verbal child. I see what Joan means about his not knowing how to play. He seems to really crave structure - as if he needs to be told what to do, exactly. [1]

Target behavior: Ben was aged 4 years 6 months at the time of the study. Ben showed a marked inability for purposeful play. His teacher reported that he "seems to not know how to simply play." He demonstrated disruptive, destructive and inappropriate actions in place of appropriate activities. In addition, Ben would not ask for help if he did not know what to do with a toy or activity with which he was unfamiliar. This behavior was most apparent during free choice and "centers." Centers refers to a period of class time during which students participate in various learning and play activities set out at various stations or "centers" throughout the room. The researcher and classroom staff chose centers as the period of data collection. Ben's treatment team identified the target behavior as independent initiation of activities. The researcher numerically and

[1] The material in italics at the beginning and ending of each case study is a character composite based on the researcher's field notes, the observer's notes, and conversations with the treatment team.

anecdotally collected data under the categories of "begin appropriate play," "inappropriate or destructive play," "seeks help, including watching others to learn how."

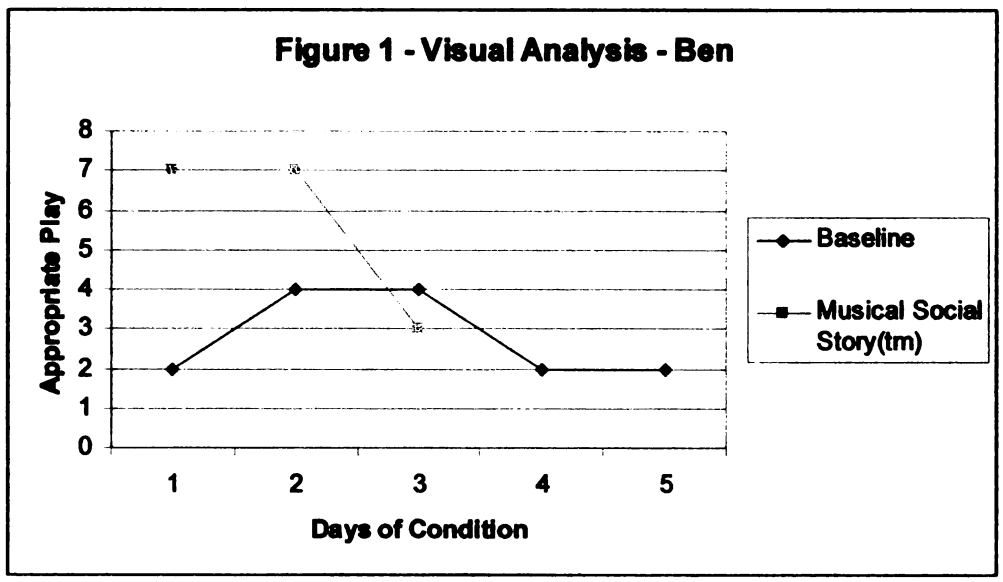
Implementation procedures: Baseline was collected for Ben for five days. Following baseline, the researcher wrote Ben's Social Story™ and set it to original music in a blues style based on the report of his preferred music given by his mother (see Appendix C). During what was to be the second week of the study, Ben was kept home from school with severe allergies. Ben returned to school for three days the following week, and the musical Social Story™ was implemented then. Ben turned the pages of his story, seeming to enjoy the music and the story. He remained engaged throughout the song all three days. On the second day, he hummed during the repetition of the story, when invited to sing along. On the third day, he sang along with the researcher during both presentations of the song. Ben's teacher reported that he was humming the tune during centers on the third day, while appropriately engaging in an activity. The following week, Ben left school to attend an Applied Behavior Analysis program out of state. Second baseline data of the removal of the musical Social Story™ condition could not be collected as a result.

Results and reactions: A series of *t*-tests comparing baseline (A1) to the musical Social Story™ intervention (B) show a significant difference between baseline and the musical Social Story™ for the target behaviors of appropriate play ($p = .050$) and

seeking help (p = .009). The target behavior of destructive/inappropriate behaviors did not indicate significance when the two conditions were compared (p = .082) (see Table1) although the results approached significance.[2]

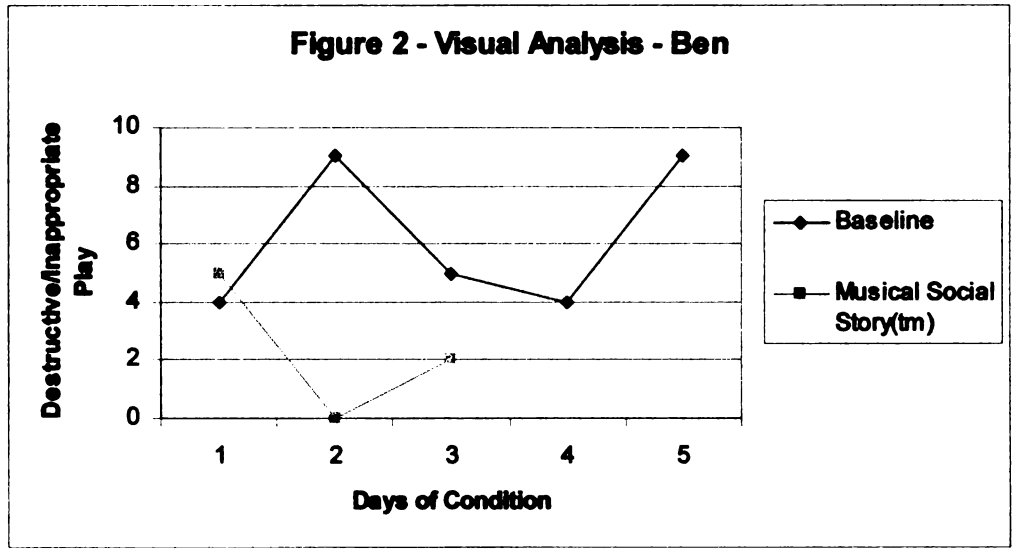
Table 1: *t*-Tests for Condition Comparisons for Ben

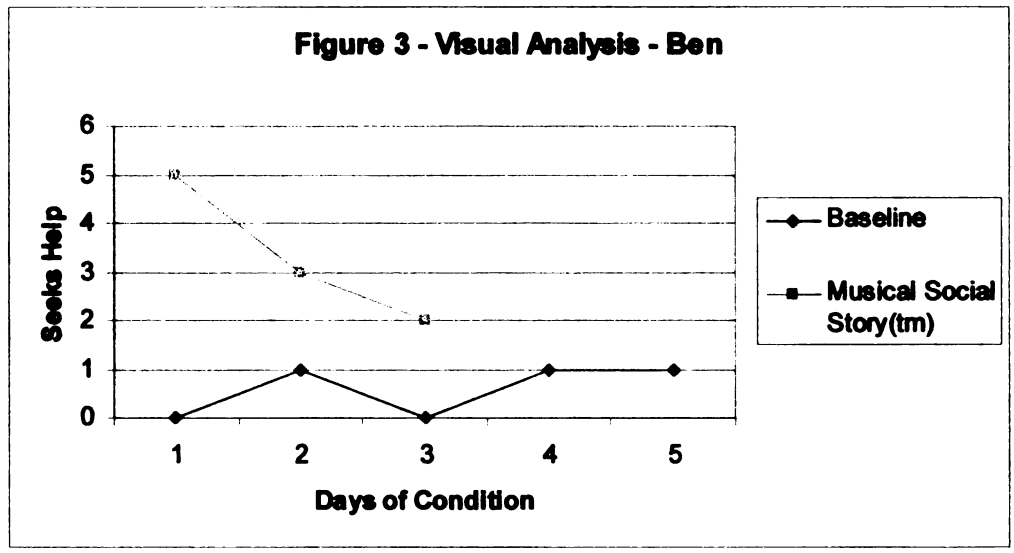
Appropriate Play	t	df	p
A1:B	-2.44487	6	0.050139
Disruptive/Inappropriate Behaviors			
A1:B	2.08878	6	0.081737
Seeking Help			
A1:B	-3.78506	6	0.009126



Images in this thesis are presented in color.

[2] Numerical data was collected only on the specific target behavior outlined in the research questions in Chapter Three. Only the target behavior data was analyzed statistically. Secondary behaviors listed on the data collection sheets and outlined in the case studies were recorded anecdotally and therefore not subject to statistical analysis or graphic study.





Visual analysis of the graphed data for the baseline condition demonstrated Ben's behavior tendencies of more inappropriate or destructive activity than appropriate play, and limited occurrences of asking for assistance. Although the musical Social Story™ was utilized for only three days, a dramatic shift in his behavior can be seen when compared to baseline. Visual analysis shows a overall increased appropriate play,

decreased destructive activity, and increased inclination to ask for help during the data collection periods following the musical Social Story™ condition (see Figures 1 - 3).

Hiding within this chaotic buzz of a boy is a very musical child. He smiled with great delight at having the opportunity to be involved in a musical activity with me. He not only stayed with the Social Story™ activity each day without additional prompting, but he also hummed or sang along - including most of the correct words by the third day. Mrs. B. said he even hummed the tune from the Social Story™ while working with her on another activity. When he first came into the classroom the third day of the music condition, he was making up words to the tune of "The Farmer in the Dell" to fit the activities he was engaging in. I hadn't heard him sing otherwise. Interesting. It makes me wonder if he used his Social Story™ song to carry the information I presented in his memory, and he is trying it out with other familiar tunes. I see so much possibility for music therapy for Ben. On a Social Story™ perspective, he demonstrates the fundamental use of Social Stories™ - a presentation of information and expectations of the child that shows an almost instant understanding after the first reading. In Ben's case, the musical presentation may have provided increased focus and thus attention to content. The music might have also provided a pneumonic devise that allowed Ben to retain the information, and recall it when needed.

Case Study - Emily

In a word, precocious. She enjoys music, books, and numbers. Wide eyes, set with delicate features framed by a veil of straight dark hair, with bangs squarely trimmed at her brow line. In contrast with this poise and grace, she holds a pacifier with one hand while allowing another to rest in her mouth. When she talks, she attempts to talk around

the pacifier rather than remove it. Rigid. Routine. Demanding. Emily has a behavior plan that gives her warnings before she is removed from the classroom for time away to calm down. Often she seems to prefer to go to time away than risk not getting her own way. It's hard to tell how much of this is conscious decision and how much is compulsion. She seems to demonstrate a somewhat flat affect. I can't seem to recall seeing her smile.

Target Behavior: Emily was four years and six months old at the time of the study. Emily displayed a range of symptoms of autism spectrum disorder somewhat different from Ben, including ritualistic play, insistence on sameness, repetitive behavior, underdeveloped peer relationships, flattened demonstration of affect, and a preference for parallel rather than cooperative play. Emily's classroom staff reported that she often engaged in what we called "hoarding" behavior. She would play with a collection of objects and take anything she thought should belong to this collection, even if it was a part of another activity or another child was using it. For example, if she got out a collection of toy dogs, she would also take a dog puzzle piece from a centers activity and add it to her stuffed dogs, much to the dismay of the child using the puzzle. Even if she did not add to her collection, she would rarely allow others to play with what collection she had chosen to use at that time and would often guard her collections from use by other children even when she was not actively using it. The other children in the classroom seem to have become conditioned to no longer attempt to play with Emily without encouragement from the classroom staff. Emily's tendency to take without askin, and sharing toys became the focus of her musical Social Story™. The researcher and interobserver collected data under the headings of: "hoarding" behavior, tries to take object/toy from another, and asks for object/toy. Free choice was the time of greatest

occurrence of this behavior and was chosen as the period of data collection. Emily had been seen in music therapy by one of the researcher's colleagues for nine months at the time of the study. The therapist and the researcher have not discussed Emily other than to verify her attendance in music therapy.

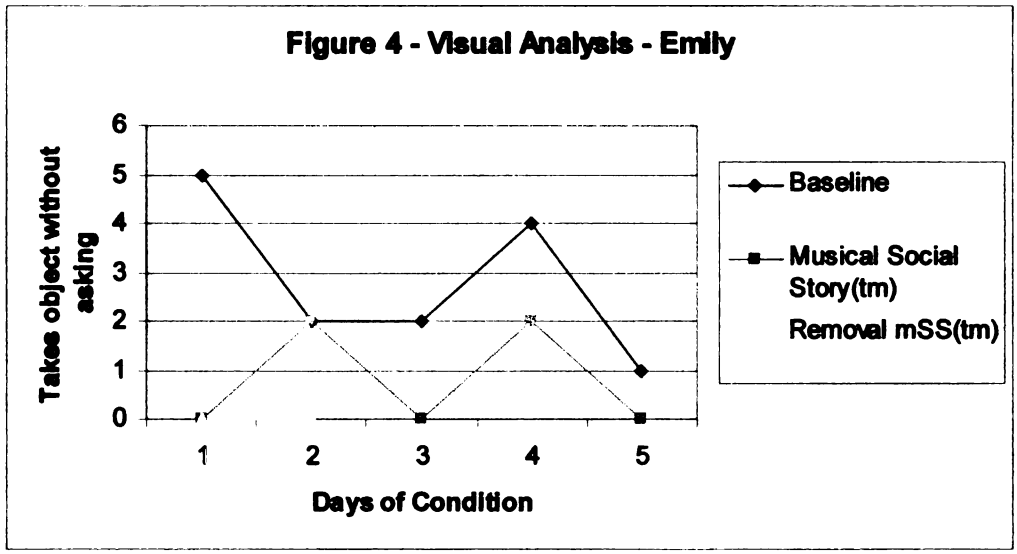
Implementation: The baseline measure lasted five days. After baseline, the researcher wrote Emily's Social Story™ and set it to music. Emily's musical Social Story™ was a sort of syllabic aria, matching her preference for 'operatic' voice as determined through observation, conversation with her mother, and reports from her classroom staff (see Appendix C). The researcher sang the musical Social Story™ accompanied by guitar. Emily preferred to hold the researcher's copy of the Social Story™ book, possibly because it contained more pages than her copy, although Emily looked only at the pages of her Story™. Emily turned the pages of the Story™ all five days of the condition. Emily did not sing the song when asked to join in for the repeat of the song daily, but did hum and strum the guitar each day. Emily's mother delivered a baby on the fourth day of the musical Social Story™ condition; thus Emily was absent on days four and five of that week. The musical Social Story™ condition was continued for two days the following week. The researcher removed the musical Social Story condition for the remaining days of that week. Emily was absent from school the last day of the study period; thus the return to baseline condition consisted of two days, and one of those days she spent 20 minutes in time away.

Results and Reactions: The researcher ran dependent *t*-tests comparing baseline (A1) to the musical Social Story™ (B), the musical Social Story™ to the removal of the musical Social Story™ (A2), and the two baselines to each other (A1:A2). These

comparisons revealed no statistical significant differences in neither "takes toys from others" nor "asks for desired toy" (see Table 2). The comparison of the baseline to the musical Social Story™ in the area of "takes toys from others" approached significance (p = .06) (see table 2).

Table 2: *t*-Test Condition Comparisons for Emily

Takes without asking	*T*	df	p
A1:B	2.15728	8	0.063056
B:A2	0.97590	5	0.373934
A1:A2	2.00446	5	0.101361
Asks for desired object			
A1:B	0	8	1
B:A2	-0.70321	5	0.51331
A1:A2	-0.70321	5	0.51331



The researcher prepared a visual analysis of the study conditions (see Figure 4). Only a graphic representation of the occurrence of "takes toys" from others was prepared, as the data for asking for a desired toy was statistically the same with one occurrence each under each condition. A review of the graphic representation reveals a declining tendency in the occurrence of Emily's taking objects from others during the musical

Social Story™ condition, and a reduction to zero occurrences during the removal of the musical Social Story™. The second baseline measure was only two days and two consecutive zero occurrences would not be a long enough period to be considered extinction of the behavior.

Emily, Emily, Emily. If only you could find the ability and desire to share all that goes on behind those wide eyes. Your words are so succinct, when you share them at all. And yet you chose to bring me into your circle, thanks to the music. The first week (baseline), you all but ignored me. As soon as that guitar came out, I became a thing of interest, and eventually I became a playmate. On the last day of the musical Social Story™ condition Emily engaged in appropriate eye contact with me throughout the song. Afterward, she invited me to play unifix cubes with her. We played together for 20 minutes, trading blocks back and forth. Unbelievable. She indicated a desire to continue with the song/guitar on all days of the intervention, preferring music to her "hoarding" opportunities. It was interesting to see the "change" in Emily's behavior during the music condition. The first day she chose to keep the Social Story™ book, and looked through it a few times before getting out one of her collections. She played with the collection in an animated way, and left the activity to do a shared activity with Mrs. B. She didn't get upset when another child approached the collection she left unguarded. She seems to be watching the other children more, and willing to share more, within reason! During the music phase, and return to baseline she shared some of her favorite things - her favorite dolls, the unifix cubes, and even time on the computer!

Case Study - Aaron

Aaron, a study in motion and expression through silence. Young, small, almost delicate. He reminds me of a quiet little mouse. Specialists consider Aaron "non-verbal," although I have heard him correctly name letter magnets, and hum to himself. He wanders the room seeming not relate to the objects or people in it. Yet he loves to be tickled. His laugh "tinkles." He seeks out a certain closeness - the first time I met him he tried to burrow in to my lap.

Target behavior: Aaron was three years and six months old at the time of the study. He displays more behavioral symptoms typical of autism than the others in the study exhibit. He avoids eye contact, engages in self-stimulatory behaviors, including running small toy cars over his chest and legs, and humming to himself. He appears physically withdrawn. Aaron has difficulty sitting and focusing attention on others. Aaron tends to 'run laps' around the room. Aaron's difficulty in sitting still and tendency to wander impedes group learning. Aaron's team selected the target behavior from this tendency. The target behavior was defined as remaining with the proximity of the group, preferably in his chair, during group learning. "Circle time" is the period of daily group learning, usually lead by the head teacher or speech therapist. Circle time was identified as the time of greatest occurrence, and data were collected during this class period under the headings of going to the circle, number of times he tries to leave the circle, and number of prompts to return.

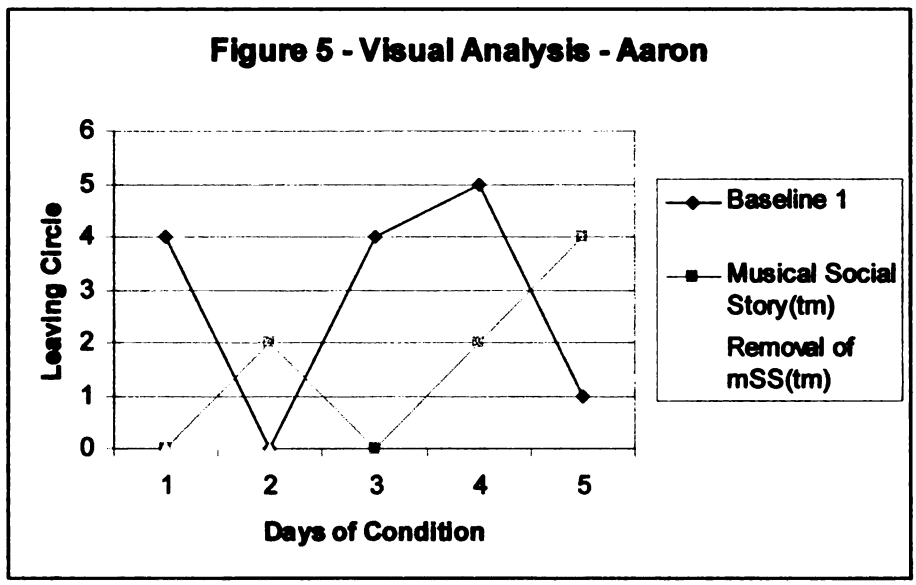
Implementation: Aaron's baseline was measured for five days. After the completion of the baseline measure, the researcher wrote Aaron's Social Story™ with a focus on circle time, and set it to music using the children's tune as its main theme, based

on the music preferences indicated by Aaron's father and upon intervals he had been heard humming to himself during initial observations. During the musical Social Story™ presentation, the researcher sang the song unaccompanied. Aaron seemed to prefer having the story sung while in a secured position, on the researcher's lap, or immediately in front of the researcher, with the researcher's arms around him to hold the book in front of them both, impeding guitar use. Aaron remained in this position for the duration of the Story™ presentation all five days of this condition. A copy of the "circle" tab from Aaron's daily schedule board was attached to a page his Social Story™ book with Velcro. The researcher helped Aaron remove this tab during a particular phrase of the song: "When I pull circle on my schedule..." reinforcing the class procedure for transitions between segments of the daily schedule. The musical Social Story™ was presented for five days during week two of the study. The Story™ condition was removed during week three, and data were collected for two days at the same time as previous data collections (circle time). Aaron was absent from school on the last three days of the study.

Results and reactions: The researcher performed dependent sample *t*-tests comparing the following conditions: baseline (A1) to the musical Social Story™ (B), the musical Social Story™ to the removal of the musical Social Story™ (A2), and the two baselines to each other (A1:A2). None of the comparisons reached statistical significance (see Table 3). Aaron received physical assistance to come to the circle daily. The researcher and independent observer were unable to determine how often this was the result of Aaron requiring the physical guidance to get him to join the group from how often this was done out of habit by the support staff.

Table 3: *t*-Test Condition Comparison for Aaron

Tries to leave circle	*t*	Df	p
A1:B	0.97980	8	0.355884
B:A2	1.27775	5	0.257444
A1:A2	1.72590	5	0.144956



The researcher prepared a graphic representation of the data for visual analysis. Aaron's attempts to leave the circle varied considerably throughout the first two conditions (see Figure 5). Aaron's attempts at leaving the circle were reduced from 14 during the initial baseline (A1) to total of 8 during the musical Social Story™ condition (B). Aaron did not attempt to leave the circle during the two days of the return to baseline (A2). However, this period is much too limited to consider two occurrences of zero an extinction of behavior. On day five of the musical Social Story™, there was a break in the normal circle time routine. The head teacher was not in the room for circle time and a substitute teacher attended the class. In addition, the changing table in the room was borrowed by a parent of a child in another class to change the diaper of a very distressed baby. This diaper change took nearly ten minutes. During this time, the substitute

suspended her presentation of group learning materials due to the noise of the crying baby. Aaron attempted to leave the circle three of the four occurrences reported during this disruption.

Aaron made purposeful eye contact with me! After I sang the Story™ to him the first time, he looked at me - engaged me - eye to eye during circle time. What a wonderful feeling to be acknowledged as a part of his circle now. It gets better. He hummed along with the song on the third day. Perhaps it is the music and not just the book and individual attention that has captured his interest. Then even better - on the final time of the song presentation Aaron said, "Circle!" Since the introduction of the Story™, Aaron seems more engaged in circle activities. He is being more verbal, even if only slightly. He said "ball" during a colored ball activity on Wednesday and "blue" before sitting in the blue chair when coming to circle on Friday.

Summary

T-tests revealed a significant increase in the occurrences of appropriate play and seeking help for Ben, approached significant decrease in the occurrences of destructive/inappropriate play, and approached significance in the decrease of Emily's target behavior of taking objects from others. All other target behaviors failed to approach statistical significance. However, graphic representation of the data shows increased positive behavior and decreased negative behavior overall during the musical Social Story™ intervention for all three participants. Examination of the anecdotal information collected suggests a clinical or practical significance demonstrating the efficacy of musical Social Stories™ for all three preschool children.

CHAPTER FIVE

Summary and Discussion

Summary

Implementation of a musical Social Story™ resulted in changes in target behaviors that met or approached statistical significance for two of the three subjects. Visual analysis showed a change in behavior in a desired direction during the musical Social Story™ implementation for all three subjects. Ben's results showed a significant difference between baseline and the musical Social Story™ condition for the target behaviors of "appropriate play" ($p = .050$) and "seeking help" ($p = .009$), and the target behavior of "destructive/inappropriate play" approached significance ($p = .082$). Emily's target behavior of "takes toys from others" approached significance ($p = .063$) in comparison between the first baseline and the musical Social Story™ condition. Her target behavior of "asks for desired object" showed no change between conditions. Aaron's results showed no significant change between conditions, although visual analysis appeared to show a lower rate of the target behavior of "leaving the circle" overall during the musical Social Story™ condition.

For Emily and Aaron, a limited return to baseline showed zero occurrences of the target behavior suggesting lasting effect of the musical Social Story™ after its removal. It is possible that Emily's new understanding of the social rules regarding play as outlined in her Story™ effectively reduced her target behavior of "taking toys from others" to practically zero. Aaron's occurrences of the target behavior of "leaving the circle" also reduced to zero for the two days of return to baseline. However, the occurrence of the

target behavior during the other conditions was not consistent enough to suggest an extinction of behavior without a much longer data collection period.

This study corroborates the finds of Brownell (2002), Pasiali (2004), and Pudenz (2004) and adds to the growing body of evidence suggesting the efficacy of musical Social Stories™ on target behaviors for children with autism spectrum disorders. The behaviors chosen for measurement in this study produced small numbers of occurrences, making statistical significance difficult to establish. Small samples present limitations in design and analysis, diminishing statistical power. In a study such as this, the 'clinical significance' may become more important than the statistical significance. The participant of a study may or may not show a change in behavior that reaches statistical significance. However, these mathematical results may not reflect a practical or clinical outcome that shows the intervention to be beneficial in an everyday setting.

The clinical significance, the subtleties in the participants' everyday reactions, were the important and moving results of the study: Aaron's increased time in the chair, increased vocalizations, and increased participation, Emily's increased social play, Ben's increased time spent on individual activities and his taking time to "learn" how to play. Music for all three of these children captured their attention. Emily preferred the music and music making over her ritualistic behavior, and requested the guitar as an activity during free choice. All three participants demonstrated a shift in their behavior in a favorable direction during the musical Social Story™ condition that seemed to carry over into the return of baseline once the condition ended. A longer-term study would need to be conducted to examine any lasting effects from the procedure.

The current study was limited to a single, self-contained, special education classroom, and had a small sample size. While this study proved successful in this setting, from a practical standpoint, it is important from a research and a clinical perspective to test if this result is reproducible in similar settings and expandable to varied settings. In addition, the limitations of the small sample found in this setting produced undesired, though unavoidable, changes in the individual subject protocols. A larger sample might help minimize these difficulties and insure successful application of protocol for a larger number of participants. This study should be expanded to include a larger number of participants from a variety of preschool classroom settings including inclusive classrooms, Developmental Kindergarten (DK), and Young Fives programs. A longer period of treatment and measurement for each might also be advisable.

In an exchange of e-mail with Carol Gray, the researcher confirmed her decision to set the Social Stories™ to original music. Gray felt that, in her experience, children with autism spectrum disorders may hold a rigid insistence on sameness in regard to musical texts, and may have adverse reaction(s) if the words to a familiar or favorite song where changed (C. A. Gray, personal communication, July 2005). Further, even if the child did not outwardly demonstrate resistance to the change of words, the child might be repeating the known words silently in his/her head, effectively blocking the intake of new information. In contrary evidence, Pudenz (2004) reported successful use of "piggy-backed" tunes in her study with four elementary students with autism. The use of piggybacked song presentations of Social Stories™ has not yet been tested with preschool children. One consideration in favor of examining the use of altering the words of pre-composed songs is the ease of use. Setting Social Stories™ to piggybacked music

might be easier for a classroom teacher or other support staff than attempting to write original music, especially if the teacher does not have any composition experience or formal music training. Gray's prediction that piggybacked songs might prove less effective than original music has not been tested. A study comparing the effectiveness of Social Story™ presentations with piggybacked songs to the effectiveness of Social Stories™ set to originally composed music might help to establish a musical Social Story™ protocol.

The reading level of the students in this study was unknown, although behavior seemed to suggest the older two participants had greater pre-reading skills than the youngest; however, this could not be assumed and was not tested. If the older two did have greater reading skills, this may have enhanced their understanding of the Story™. The effectiveness of musical Social Story™ presentation for individuals across reading levels and across ages is another area of recommended study to further the development of musical Social Story™ protocol.

The effective use of musical Social Stories™ could go beyond the classroom into the homes of the preschool children with autism. There is potential for home use. Parents need an arsenal of teaching tools and coping methods of their own when an autistic child is in the home. Parents could be taught how to write Social Stories™ and either set them to original or "piggybacked" music. This is a recommended area of future study.

Although Social Stories™ were originally developed by Gray as a teaching tool for children with autism, their successful use has been demonstrated for others as well, with and without disabilities. As musical Social Stories™ are researched and a procedure

for their creation and implementation begins to emerge, their application beyond the area of autism should also be explored.

Autism is a spectrum disorder. Every individual with autism displays a unique set of symptoms at varying degrees of intensity, making formalized study of treatments, programs, or procedures to assist individuals with ASD extremely difficult. Even when rigorous studies are carried out, their findings are not generalizable, but rather, suggestive at best. However, the individual nature of autism requires that we as educators, therapists and support staff have as many tools in our bag of tricks as possible in order to assist each child to the best of our abilities. Musical Social Stories™ seem to be one more tool at the disposal of teachers and therapists to introduce information that other more conventional methods of teaching or treatment have not been successful in presenting to a child with autism.

APPENDIX A

Data Collection Sheets

Subject 1 = Ben's Data Collection Sheet

Subject 2 = Emily's Data Collection Sheet

Subject 3 = Aaron's Data Collection Sheet

Subject 1	target behavior:	Independent initiation of	activities	
Approach activity	**Begin appropriate play**	Inappropriate or	Seeks help	Comments
		Destructive Play	(including watching others	
			to learn how)	

Subject 2	target behavior:	Not taking from others	
"hoarding" behavior?	**tries to take object/toy from another**	asks for oject/toy	Comments
			.

Subject 3	target behavior:	Going to and remaining	at circle time
going to circle -	**# of times tries to leave circle**	# of prompts to return	Comments
How many prompts?			
			.

APPENDIX B

Social Story™ Texts

Reproduction of Ben's Social Story™ book.

Reproduction of Emily's Social Story™ book.

Reproduction of Aaron's Social Story™ book.

Images in this thesis are presented in color.

Playing at Centers

Playing at Centers

My name is Ben. Mrs. Beeman is my teacher.

Most days at school I do centers after circle time.

During centers there are activities and games to play.

Sometimes I choose what I want to do during centers.

Sometimes Mrs. Beeman, Jan, or Katie chooses what I need to do.

Some activities I have played before.

Some activities I have not played before.

It is ok to try to do an activity I have not done before.

If I do not know how to do an activity I can ask for help.

Centers gives me a chance to play and explore.

This is ok.

Playing Together with Toys

Playing Together with Toys

My name is Emily. I play with many toys in Mrs. Beeman's room. These are some toys I play with often.

Sometimes people want to play with the same toys. Sharing toys is important. Sometimes someone has a toy I want to use. Asking to use a toy lets the other person know that I want a turn. Taking a toy away from someone may make the other person sad or angry. I will try to let the person finish using the toy I want before I may take it.

Staying in My Chair at Circle Time

Staying in My Chair at Circle Time

My name is Aaron. On most school days I have circle time.

When I pull Circle on my schedule it is time to sit in a chair on the circle.

Teachers use circle time to talk or sing with many children at the same time.

It is important to stay in my chair unless a teacher asks me to stand up. Adam will try to stay sitting in a chair during circle time.

APPENDIX C

Music

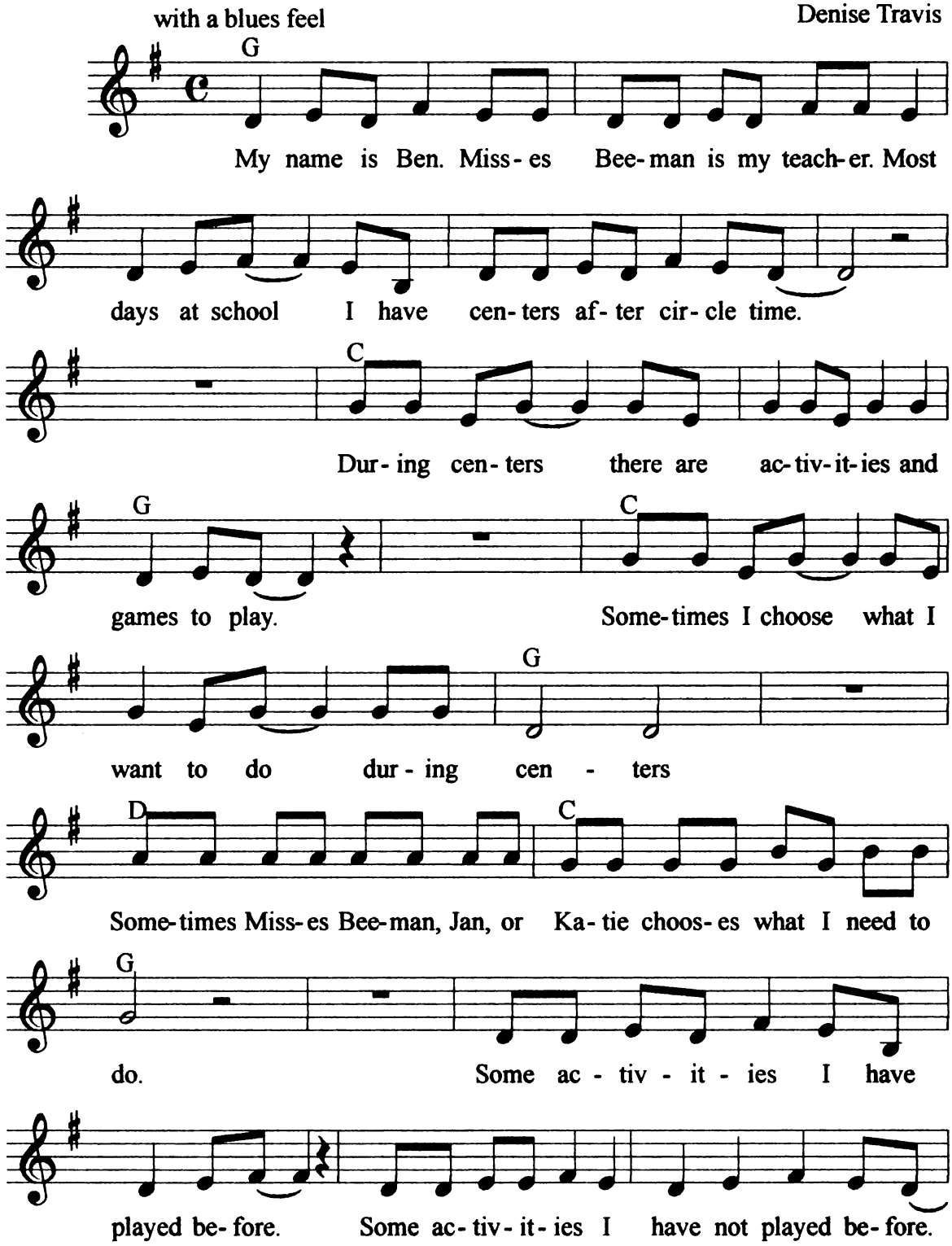
Music written for Ben's Social Story™

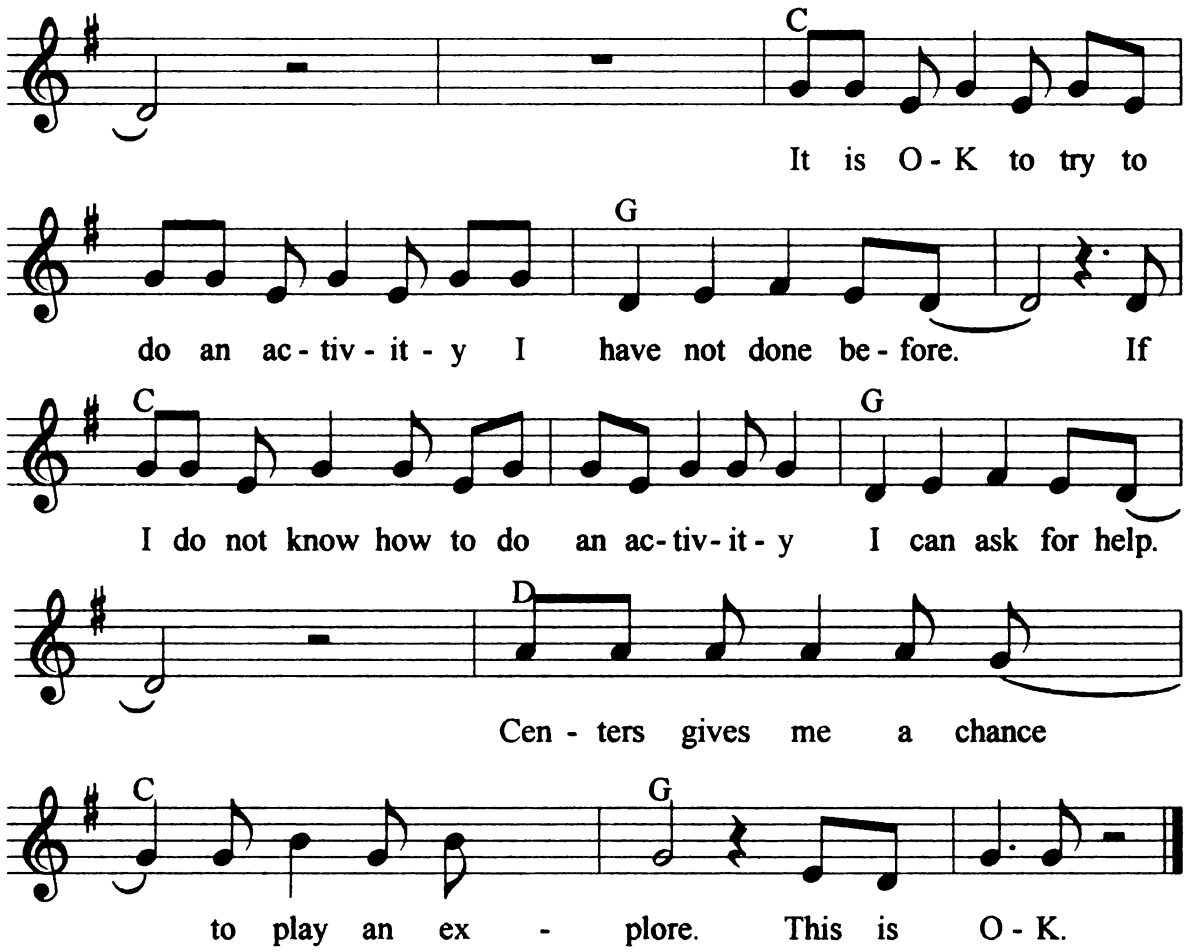
Music written for Emily's Social Story™

Music written for Aaron's Social Story™

In Aaron's song, the word "schedule" is notated with the standard grammatical break of "sched-ule" for ease of reading. The researcher used a mid-western dialect pronunciation of the word as found in Webster's New World Dictionary, third edition, (ske' joo el). This pronunciation adds an additional unaccented syllable. The researcher sang this word as two eighth notes on the note e and a quarter note on the note g.

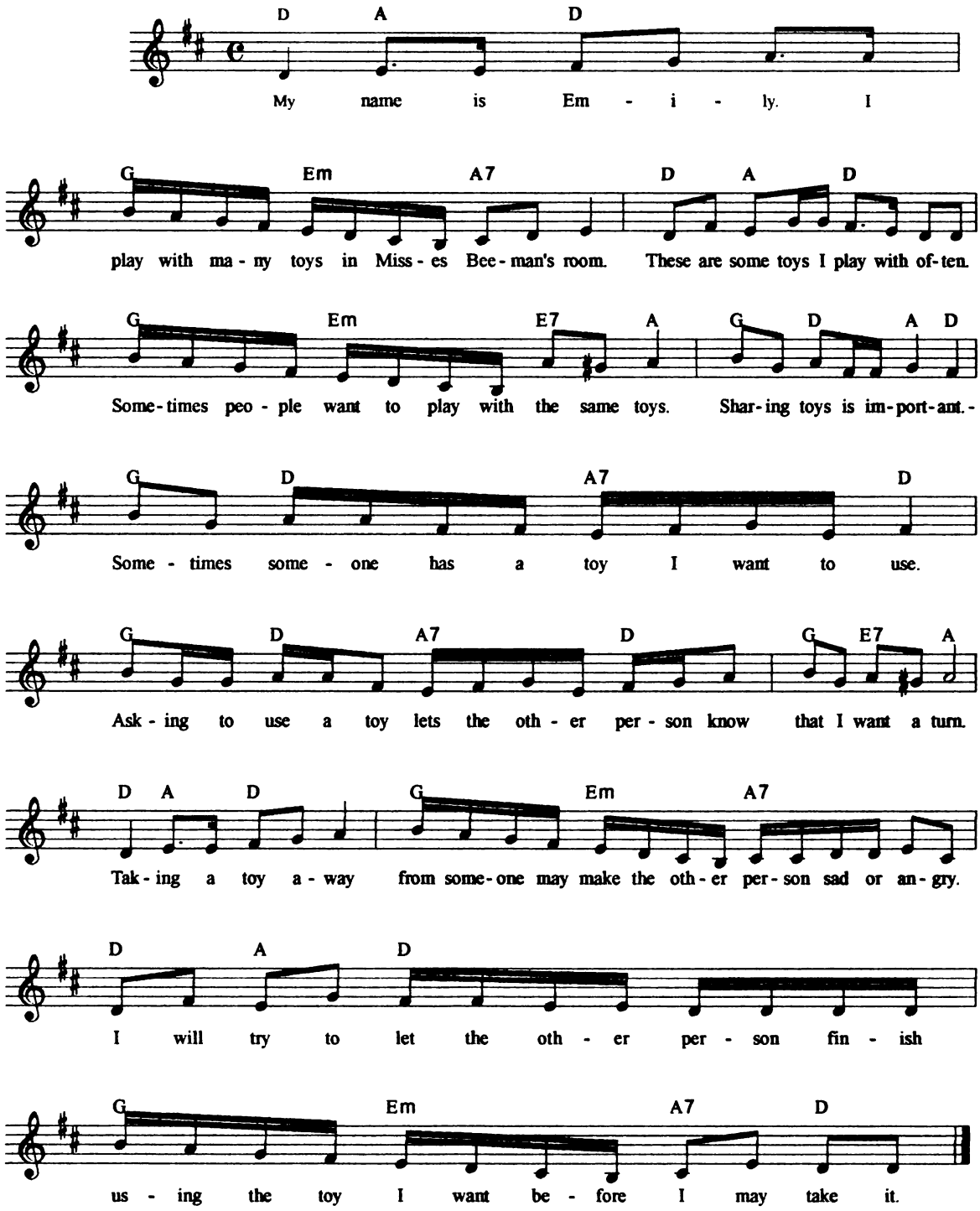
Playing at Centers




C
It is O - K to try to
G
do an ac - tiv - it - y I have not done be - fore. If
C
G
I do not know how to do an ac - tiv - it - y I can ask for help.
D
Cen - ters gives me a chance
C
G
to play an ex - plore. This is O - K.

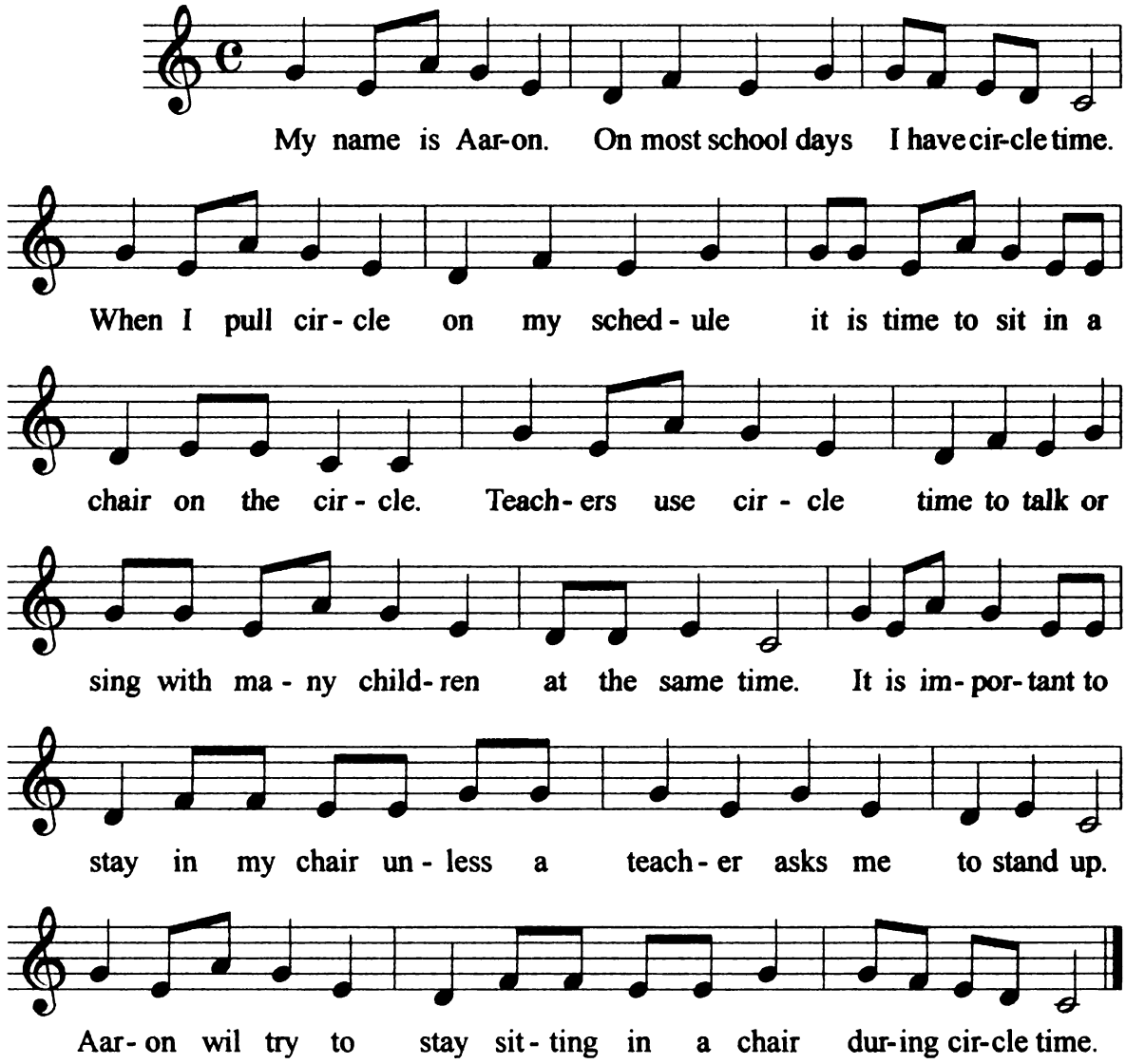
Playing Together with Toys

Denise Travis



Staying in My Chair at Circle Time

Denise Travis



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