Decreasing Inappropriate Behaviors for Adolescents With Autism Spectrum Disorders Using Modified Social Stories

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Abstract: A multiple baseline design study was implemented to assess the effects of a modified social story intervention on inappropriate social behaviors of three adolescents with moderate autism. Baseline data were collected on inappropriate behaviors that included refusal to stand, use of a high-pitched voice, and placing hands/objects in mouth. Individualized social stories, ranging from five to seven pages and containing text, color photographs, and callouts, were created for each student. Results suggest that social stories immediately improved behavior for two of the participants and these improvements were maintained. Information is also provided regarding teacher opinion on the use of social stories. Implications for training and future research are discussed.

During the past 20 years, there has been a substantial increase in research related to autism spectrum disorders (ASDs), including literature that pertains to effective interventions. Because of the complexity of the disorder, these interventions have addressed the communicative, behavioral, and social needs of children with autism (Odom et al., 2003). In the area of social skills, although a number of programs have been developed for children, few address the needs of adolescents.

The lack of needed social skills and the presence of inappropriate social behaviors critically affect the lives of individuals with autism. A variety of interventions has been attempted for children with autism to decrease inappropriate behaviors (e.g., McConnell, 2002). These include pivotal response training (Sherer & Schreibman, 2005; Koegel, Carter, & Koegel, 2003; Koegel, Koegel, Harrower, & Carter, 1999), video modeling (Ayres & Langone, 2005; Charlop-Christy, Le, & Freeman, 2000), peer-mediated interventions (Nelson, McDonnell, Johnston, Crompton, & Nelson, 2007; DiSalvo & Oswald, 2002; Gilberts, Agran, Hughes, & Wehmeyer, 2001; Laushey & Heflin, 2000), self-management (Koegel, Koegel, & McNerney, 2001; Newman, Reinecke & Meinberg, 2000), and the use of visual supports (Charlop-Christy, Carpenter, Le, LeBlanc, & Keller, 2002; Pettmer, Simpson, Myles, & Ganz, 2000; Johnston, Nelson, Evans, & Palazolo, 2003). This array of interventions responds to the range of characteristics of individuals with autism, which have typically proved resistant to treatment.

Treatments implemented to date have extended our knowledge of methods for improving the social behaviors of students with autism (Simpson et al., 2005; Omnes & Lucangeli, 1999). One approach to training social skills for children with autism includes the use of Social Stories™. A social story is a short, personalized story designed to help individuals with autism understand a specific social situation. Gray and Garand (1993) introduced this social story concept and presented broad guidelines as to how they could be developed and implemented for individuals with autism. Initially, they suggested that the stories include three sentence types (a) descriptive (describes the scenario), (b) directive (describes the desired response), and (c)
perspective (states the feeling of others). They did not recommend illustrations but added that “photographs have been effective in some stories” (Gray & Garand, p 4). In regards to implementation, they present three types of approaches: (a) a student reading a story independently, (b) putting the story on cassette tape for nonreaders, and (c) creating a videotaped social story for those who are independent or need assistance. They also suggest that comprehension be checked either by a student checklist or having a student answer questions at the end of the story.

Since 1993, researchers have taken liberty to alter aspects of the social story format suggested by Gray (1994) to meet the needs of individual students. Effective interventions, by design, should be individualized for specific children. For example, Agosta, Graetz, Mastropieri and Scruggs (2004) wrote the following illustrated, modified social story for a six year old boy with autism who exhibited screaming behaviors in school: Page 1: Everyday we sit in circle; Page 2: All the children sit quietly; Page 3: Sometimes in circle I want to scream; Page 4: I need to sit quietly and not scream in circle; Page 5: It makes my teacher happy when I sit quietly and do not scream. She says, “Good job, Robert!” (p. 283). To utilize an interest of the child, a response cost system was incorporated with the modified social story.

Ali and Frederickson (2006) report on 16 research studies completed between 1994 and 2004 that implemented social stories. The majority of these social story studies (those adhering to the original guidelines and others who have not) have been conducted with young children with autism, ages 4 to 11, to improve a variety of social behaviors, including coping skills and independent behaviors (Haggerty, Black, & Smith, 2005; Ivey, Heflin, & Alberto, 2004), inappropriate talking out (Crozier & Tincani, 2005), hand washing and staying on task (Hagiwara & Myles, 1999), social skills and communication (Agosta, et al, 2004; Barry & Burlew, 2004; Keyworth, 2004; Demiri, 2004; Smith, 2004; Adams, Gouvousis, VanLue, & Waldron, 2004), bedtime behaviors and mealtime skills (Burke, Kuhn, & Peterson, 2004; Moore, 2004; Norris & Dattilo, 1999), aggressive behaviors (Kuoch & Mirenda, 2003; Lorimer, Simpson, Myles, & Ganz, 2002), anxiety (Cullain, 2002), vocal volume and shouting (Brownell, 2002; Scattone, Wilczynski, Edwards, & Rabian, 2002), and learning new routines (Gray & Garand, 1993). The majority of these studies report positive findings with the use of social stories as an intervention but, as will be discussed, not all adhere to the original social story format.

Unfortunately, even fewer social stories studies have been conducted with individuals between 11 to 15 years of age. Current research on social stories for children with autism between the ages of 11 to 15 has been shown to decrease inappropriate behaviors including staring at females (Scattone et al., 2002), increase communication/social skills (Keyworth, 2004; Rogers & Myles, 2001; Thiemann & Goldstein, 2001), increase greeting responses and decrease aggression (Swaggart et al., 1995), increase chewing with mouth closed/napkin use and eating related skills (Bledsoe, Myles, & Simpson, 2003; Staley 2001), and reduce precursors to tantrum behavior (Kutlter, Myles, & Carlson, 1998).

Again, with many of these studies, researchers claim positive findings. However, Staley (2001) reported that social stories did not positively impact behaviors for three adolescents with various disabilities, including autism, although reinforcers were successful in modifying behavior.

While these studies use the term social stories, many deviate from the original guidelines recommended by Gray and Garand (1993) thereby making it difficult to assess if the social story, or which of its components, were responsible for any improved behaviors. For example, Hagiwara and Myles (1999) introduced the social stories through the use of a computer and Feinburg (2001) had students read their social stories five times a day. Barry and Burlew (2004) prompted students to practice what they had read in their social story while Haggerty, Black, and Smith (2005) included an apron story telling technique. Crozier and Tincani (2005) in another recent study acknowledge that their modified social story with prompts may have been more effective than the basic social story in producing the desired changes in behavior of an eight year old with autism.

In addition, many of the social story studies contain design flaws that render conclusions
tentative at best. For example, two of the studies utilize an AB design which does not take into account other classroom variables (Norris & Dattilo, 1999; Swaggart et al., 1995) while others lack reliability procedures (Rowe, 1999; Romano, 2002) and others report implementation flaws (Adams et al., 2004). Additional studies have used the social story intervention with other behavior change techniques (Crozier & Tincani, 2005; Thiemann & Goldstein, 2001; Staley, 2002; Swaggart, et al., 1995; Agosta et al., 2004). Earlier studies also provided vague description of participants thereby making it difficult to know which students may best benefit from social stories (Swaggart et al., 1995; Rogers & Myles, 2001). It is still not known which components of the social stories lead to improved results or how the implementation of the social story may affect results with various individuals exhibiting a variety of cognitive and communicative skills.

Despite lack of consistency in design, development, and implementation, previous research has provided the foundation for additional investigations examining the effects of modified social stories, especially for adolescents. As students with autism spectrum disorder reach adolescence, the potential impact of inappropriate social behavior increases. It is therefore critical to have additional intervention efficacy research to help guide practitioners in reducing inappropriate behaviors and increasing appropriate behaviors for adolescents with autism. This study, therefore, intends to expand the research base by examining the effects of modified social stories for adolescents with autism. In the present study, the modified social story adheres to the original guidelines of a simple story written from the student’s perspective. It deviates from the original guidelines in that color photographs with callouts were included in the stories. The following research questions were examined:

(1) Would the use of the modified social story be an effective social skills intervention that increased appropriate behaviors for adolescents with autism? (2) Would this increase in appropriate behaviors generalize to other settings?, and (3) Would this increase of appropriate behaviors be maintained when the modified social stories were withdrawn?

In addition to the lack of research on adolescents with social stories, previous studies have neglected to elicit opinions from staff regarding social stories as an intervention in an autism classroom. Therefore, this study also asked the following: Following implementation of the social stories, would school staff be able to (a) describe the basic guidelines for developing a social story for a student and (b) describe situations in which a social story may be used?

**Method**

**Participants**

Five adolescents with autism were originally selected for the study. One participant was dropped from the study when it became obvious that he was unresponsive to the modified social story as presented in this study and the decision was made that additional procedures would be needed to effectively impact his behavior. A second participant was dropped due to a lack of reliability during data collection. Three participants therefore were the focus of this study. None had previous experience with social stories. Criteria for selection of students were as follows: (a) males or females between the ages of 12 and 15 with an autistic spectrum disorder; (b) available intellectual, language, social, and academic records obtained within the past two years; (c) students not classified as having Asperger’s Syndrome; and (d) verification of autism on the Gilliam Autism Rating Scale (GARS) (see Table 1). Students with Asperger Syndrome were not included since the study wanted to examine the effects of the modified social story with students who appeared to have a cognitive impairment in addition to autism. The following section presents a more detailed description of each participant.

**Participant 1: Ronnie.** Ronnie was a 12-year, 10 month old Caucasian male classified as having an average degree of autism severity, based on the Gilliam Autism Rating Scale (Gilliam, 1995). This meant that Ronnie displayed delays in communication and social interactions and exhibited stereotyped behaviors. Although no IQ score had been established for Ronnie, he had an age equivalent score of 2 years, 6 months on the Peabody Picture Vocabulary Test-Revised (PPVT-R; Dunn & Dunn, 1981). He was nonverbal and used ges-
tures as a primary means of communication. Ronnie responded to commands and gave fleeting eye contact to staff and peers. The teacher reported that his skills in reading and math were at the Kindergarten level. In the classroom, Ronnie usually sat quietly at his desk and rarely interacted with peers or staff. The teacher reported that he preferred a very structured day and would become upset and yell if his routine were interrupted.

Physical Education (P.E.) was frequently problematic for Ronnie. During P.E., a 45-minute class, Ronnie frequently dropped to the ground when asked to participate in activities. This occurred both outside, when P.E. was held on the field, or in the gymnasium. If asked to stand, Ronnie would refuse and when physically moved to stand, he immediately fell to the ground. The teacher found this behavior especially problematic and had no success with a previous intervention (providing a reinforcer for standing). The teacher decided that this behavior should be targeted for the social story intervention. The operational definition of Ronnie’s target behavior was “when given a verbal direction by staff to ‘stand up’ or ‘get up,’ Ronnie stands independently within 15 seconds.” Although it was recognized that this may not mean that he would be “participating”, the teacher believed that getting Ronnie to a standing position was the first important step toward active participation in P.E.

Participant 2: Bobby. Bobby, a 13-year old Middle Eastern male diagnosed with autism at the age of two, appeared good-natured in all settings and participated eagerly in most activities. Recent administration of the Gilliam Autism Rating Scale (Gilliam, 1995) suggested an average degree of autism severity. While Bobby did not display stereotyped behaviors that interfered with his school day, he displayed deficits in the social use of language and in social interactions. He had an IQ of 42 as measured by the Woodcock-Johnson Psychological Battery- revised (Woodcock & Johnson, 1989). Bobby was able to read sentences at the first grade level and enjoyed reading and talking with staff. He was alert to other students in the building and would frequently attempt to give them a “high five” as he passed in the hall. Bobby spoke in complete sentences to both staff and peers. He eagerly began conversations with staff and peers in the morning and talked appropriately about a variety of topics. Although he had a natural deep voice, he frequently changed to a high pitched, infantile voice that was incompatible with his size and gender. His teacher was concerned that if Bobby used this inappropriate voice in the general education settings that he would be the object of ridicule. For that reason, the teacher selected Bobby’s high-pitched voice for the modified social story intervention. The operational definition of Bobby’s behavior was “when talking with staff or peers, Bobby uses an appropriate vocal pitch.”

Participant 3: Cathy. Cathy, a 12-year, 2 month old Caucasian female diagnosed with autism and a cognitive impairment, had a very limited vocabulary and used gestures to communicate. Recent administration of the Gilliam Autism Rating Scale (Gilliam, 1995) suggested an average degree of autism severity. She demonstrated severe deficits in commu-

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### TABLE 1
Demographic Data on Participants

<table>
<thead>
<tr>
<th>Student</th>
<th>Age</th>
<th>Gender</th>
<th>Ethnicity</th>
<th>Autism Diagnosis*</th>
<th>Language Functioning</th>
<th>Adaptive Behavior</th>
<th>Cognitive Level</th>
<th>Reading Grade</th>
<th>TARGET BEHAVIOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ronnie</td>
<td>12-10</td>
<td>Male</td>
<td>Caucasian</td>
<td>Average</td>
<td>62 (V)</td>
<td>65 (V)</td>
<td>26 (PPVT)</td>
<td>K-1 (WJPB)</td>
<td>stands independently</td>
</tr>
<tr>
<td>Bobby</td>
<td>13-1</td>
<td>Male</td>
<td>Middle Eastern</td>
<td>Average</td>
<td>66 (V)</td>
<td>48 (V)</td>
<td>IQ = 42 (WJPB)</td>
<td>1 (WJPB)</td>
<td>appropriate voice</td>
</tr>
<tr>
<td>Cathy</td>
<td>12-2</td>
<td>Female</td>
<td>Caucasian</td>
<td>Average</td>
<td>63 (V)</td>
<td>59 (V)</td>
<td>24 (WJPB)</td>
<td>K (WJPB)</td>
<td>hands down</td>
</tr>
</tbody>
</table>

Note. * Gilliam Autism Rating Scale; V = Vineland; WJPB = Woodcock-Johnson Psycho. Battery; PPVT = Peabody Picture Vocabulary Test
nica
tion and social interactions. Although no IQ score had been established for Cathy, she had an age equivalent score of 2 years on the Woodcock-Johnson Psychological Battery-revised (Woodcock & Johnson, 1989). Cathy was a nonreader and when informally assessed, was only able to read her first name. She could be seen slumped over her desk in her classroom and appeared unresponsive to staff and peers. She frequently sucked her fingers and objects while in her classroom or in other school settings. At times, she screamed and rocked in her chair, especially when left unattended or asked to put her hands down. The teacher felt that it was difficult to get Cathy to work in the classroom because of this behavior. For that reason, her social story addressed keeping her hands down. The operational definition of Cathy’s behavior was “when seated in the classroom, Cathy keeps her hands down and keeps materials away from her lips.”

Design
A multiple baseline design across participants (Tawney & Gast, 1984) was implemented to evaluate the effectiveness of modified social stories on inappropriate behaviors. A target behavior was identified for each participant and tracked during baseline, intervention, generalization, and maintenance phases (see Table 1).

Design of Social Stories
In consultation with parents, special education teacher, special education paraprofessional, and speech clinician, individual modified social stories were developed for participants using basic guidelines recommended by Gray and Garand (1993). The first author and speech clinician had previously received a one day in-service on the development of social stories. According to Gray and Garand, social stories may be written with three types of sentences in a prescribed ratio format. Sentence types are: descriptive, directive, and perspective. Regardless of the length, the story should include one directive sentence and two to five descriptive and/or perspective sentences which consider the student’s age, reading and comprehension level, interests, attention span, and preferred learning style.

Descriptive sentences describe what people do in particular social situations. For example, “Almost every day I sit in circle.” The directive sentences identify a suggested response or choice of responses to a situation. They may begin with the words, “I can” or “I will” and should tell the student in positive terms what to do or say in a target situation. Perspective sentences describe the reactions and responses of others in the target situation. They may include the feelings of others and are written from the child’s perspective, e.g. “It makes my teacher happy when I sit quietly during circle time.” The sentences included in these modified social stories included these three types of sentences.

The modified social stories in this study varied from Gray and Garand’s (1993) initial guidelines to include actual photographs of students and teachers. Since the participants had not shown response to stories that included only text, the researcher, teacher, and speech clinician felt that the photographs would provide needed concrete visual images. In addition, the photographs contained ‘callouts’, words that appear to come from a person’s mouth. Callouts are frequently used in typical comic strips. Because the teacher had stated that the students enjoyed typical comic strips, it was decided to use the callouts in their social stories. Stories also included only positive examples of desired behaviors. Each story was designed on 8.5 x 11 inch paper, approximately six pages in length, and was bound and laminated. Initial versions of stories were shown to special education teachers and speech clinicians considered experts in autism for feedback prior to implementation. Revised versions were developed based on their feedback. Ronnie’s social story follows:

Page 1: Ronnie Learns to Stand and Play (with photo of Ronnie standing).
Page 2: My name is Ronnie and I go to Lawrence Middle School (with photo of the school).
Page 3: Almost everyday we have P.E. (with photo of Ronnie and classmates at P.E. Ronnie is standing next to his peers).
Page 4: Everyone stands up. Everyone plays (with photo of Ronnie and classmates playing in P.E.).
TABLE 2
Modified Social Stories for Additional Participants

<table>
<thead>
<tr>
<th>Bobby: Inappropriate high, vocal pitch</th>
<th>Cathy: Putting hands/objects in mouth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Page 1 Title Page:</strong> Bobby Learns to use a Young Man’s Voice (smiling picture of Bobby)</td>
<td><strong>Page 1 Title Page:</strong> Cathy Keeps Her Hands Down (smiling photo of Cathy)</td>
</tr>
<tr>
<td><strong>Page 2:</strong> My name is Bobby. I go to Lawrence Middle School. (photo of school)</td>
<td><strong>Page 2:</strong> My name is Cathy. I go to Lawrence Middle School. (photo of school)</td>
</tr>
<tr>
<td><strong>Page 3:</strong> When I am at school, I like to talk with my friends. (photo of Bobby surrounded by peers)</td>
<td><strong>Page 3:</strong> Every day, I sit at my desk. I have my work to do. (photo of Cathy at desk; hands down)</td>
</tr>
<tr>
<td><strong>Page 4:</strong> My friends are young men. They use young men voices. (three photos of friends with callouts of them talking)</td>
<td><strong>Page 4:</strong> I am a big girl now. I need to keep my hands down. (photo of Cathy in hallway, smiling)</td>
</tr>
<tr>
<td><strong>Page 5:</strong> I am a young man. I need to use a young man’s voice. (photo of Bobby with a callout, saying ‘I have my book, My Smith.’ Another photo of teacher says, ‘Nice voice, Bobby!’</td>
<td><strong>Page 5:</strong> When my hands are down, my teacher and friends can hear me talk. (photo of Cathy with callout, ‘Mrs. Smith, I am ready to work.’)</td>
</tr>
<tr>
<td><strong>Page 7:</strong> My teachers say, “Good work, Cathy!” (photos of Cathy, Teacher and Paraprofessional; callouts say, ‘Nice talking, Cathy!’)</td>
<td><strong>Page 7:</strong> My teachers say, “Good work, Cathy!”</td>
</tr>
</tbody>
</table>

Page 5: I will stand up. I will play (with photo of Ronnie standing and playing in P.E.).
Page 6: It makes my teachers and friends happy when I stand up and play (photo of teachers, Ronnie and classmates).
The two other students’ modified social stories also followed this format and are presented in Table 2.

**Staff and Observer Training**

Special education personnel and graduate student observers were trained in procedures for using the modified social stories and how to elaborate on them by pointing out the pictures or asking the students questions. The researcher presented a sample social story to the staff and modeled the desired behavior of how the modified social story was to be read to participants. In addition to reading the story, the researcher also modeled how to question and/or comment to the participants about the pictures presented in the modified social story. For example, for Ronnie’s story, the paraprofessional commented, “Ronnie! Look at you! You are standing! Way to go!” The observers were trained to follow steps to implement the social story and to use simultaneous data collection involving interval recording (Bobby and Cathy) and duration recording forms (Ronnie).

**Fidelity of Treatment**

Teachers were observed at least once weekly throughout the study by graduate students trained in the social story implementation. Following each observation, teachers/staff were provided feedback if the social story had not been implemented correctly. The observers recorded the presence or absence of the necessary experimental procedures. Teachers were trained to (1) read the social story at appropriate time (prior to P.E. for Ronnie and during P.E. if his body fell to the ground and within 20 minutes of language arts for Bobby and Cathy), (2) ask the student questions and/or comment about the social story, and (3) leave the social story in the student’s desk. The percentage of experimental procedures present during the observations was calculated by dividing the number of correct procedures by the number of correct and incorrect procedures and multiplying by 100. Across the three participants, the procedural reliability mean was 97% (range 80%-100%).
Data Collection

Baseline procedures and intervention phase. Data collection took place daily over an eight-week period. Baseline data were collected from 4 to 13 days. Baseline data for participant 1, Ronnie, were collected during 45 minute P.E. sessions (in the morning, 4 days). Baseline data for participant 2, Bobby, were recorded every 15 seconds during a 20 minute period of language arts (in the morning for 11 days). Baseline data for participant 3, Cathy, were recorded every 15 seconds for 20 consecutive minutes during language arts (in the morning for 13 days).

After target behaviors were identified, staff trained, and the modified social stories developed, performance levels were established for each participant following at least four consecutive days of observations (see Figure 1). Intervention data were collected as follows: Participant 1 (Ronnie): 9 days; Participant 2 (Bobby): 11 days; Participant 3 (Cathy): 20 days. During the intervention phase, the modified social stories were read at least twice to each participant. For Bobby and Cathy, the modified social stories were read during the first 20 minutes of the language arts period. Ronnie’s social story was also read during the
morning but prior to P.E. Ronnie’s modified social story was then carried to P.E. by the paraprofessional and was read to him upon entering the P.E. area, either the gymnasium or outside playground. The teacher, paraprofessional or speech and language teacher reviewed modified social stories individually with each student. The modified social stories remained at the students’ desks throughout the day. Project staff consisting of the first author and two graduate assistants, recorded observations. To have a clearer understanding of classroom activity, observers also took anecdotal notes including a description of the classroom activity, a description of staff and student behaviors during the implementation of the modified social story, and behavior of each student.

Generalization and maintenance. All participants except Ronnie were observed in another setting (e.g., lunch, music or library) to see if the inappropriate behavior was present. Since Ronnie’s behavior only occurred during P.E., alternatives were not feasible. Generalization data were collected for five days. To assess maintenance, approximately 3 to 4 weeks following intervention, observers returned to record the target behaviors during morning work sessions (for participants 2 and 3) and during P.E. for participant 1. Maintenance data consisted of two days for Participant 1 (Ronnie) and three days for Participants 2 (Bobby) and Participant 3 (Cathy).

Reliability
Interobserver agreement was assessed on approximately 20% of observations across all phases. If 80% or greater reliability was not achieved (calculated as a percentage of agreement of observations), further training on observational techniques was conducted. A coefficient of agreement was calculated for each participant, and then averaged to yield a mean interobserver coefficient. Interobserver agreement ranged from 91% to 95% for the three participants.

Interviews with Staff
Following implementation of the social stories, interviews were conducted with the autism teacher, paraprofessional, and speech clinician. Interviews focused on questions about the design, development, implementation, and effect of the social story intervention.

Results
This studied explored three research questions: (1) Would the use of modified social stories be an effective social skills intervention that increased appropriate behaviors for adolescents with autism? (2) Would this increase in appropriate behaviors be generalized to other settings, and (3) Would this increase of appropriate behaviors be maintained when the modified social stories were withdrawn? In regards to the first research question, visual inspection of data indicates that the introduction of the modified social story resulted in immediate decline in the inappropriate behaviors for the three participants. Figure 1 presents the data for the three participants. These data also indicate positive findings for research question two (behaviors were generalized to other settings) and research question three (appropriate behaviors were maintained) (see Table 3). It was assumed that behavior change occurred if there was no overlap between the baseline and intervention phases, no overlap between the baseline and generalization phase, and an estimated change in the trend across 7 to 10 data points. This would indicate that the general slope or general direction of the behavior was decreasing (Kazdin, 1994). Table 3 presents the slope or general direction of the inappropriate behaviors for each participant. The decreasing slope was greatest for participants 1 and 2 (Ronnie and Bobby) but data on participant 3, Cathy, also indicates a decline in her inappropriate behavior. The following section presents detailed results for each participant.

Individual Participant Results
Participant 1: Ronnie. Baseline data were recorded during the 45 minute P.E. session. During the baseline phase (4 days), percentages of time Ronnie spent on the ground ranged from 74% to 90%, with a median level of performance of 82.33% (mean = 83.41%). On the fifth day, the social story was introduced to Ronnie. During the intervention phase (9 days), the level of performance...
ranged from 0% to 28%, with a median level of performance of 14% (mean = 13.37%). Four weeks after the social story had been withdrawn, Ronnie sat only 4.5% of the total time period.

Participant 2: Bobby. Baseline data on Bobby’s use of an appropriate-pitched voice were recorded every 15 seconds during a 20 minute period of language arts, for eleven days. Data indicated he used an inappropriate high-pitched voice 15% to 65% of the time, with a median of 22.45% (mean = 30.95%). During the intervention (11 days), the target behavior ranged from 28% on the first day to 0%, with a median performance of 0% (mean = 5.21%). Data collection in other school settings (five days) indicated that the percentage of time Bobby used a high-pitched voice ranged from 0% to 12.5% with a median of 5.62 % (mean = 3.91%). Twenty-two school days later, the percentage of high-pitched voice ranged from 3.7% to 18.7% with a mean of 10.36%.

Participant 3: Cathy. Observations of Cathy putting fingers/objects/hair in or on her mouth were recorded every 15 seconds for 20 consecutive minutes during language arts for 13 days. Data indicated variability in Cathy’s behavior from a low of 3.75% to 100%. The median performance during baseline was 60% (mean = 50.62%). Although not represented in these data, Cathy frequently experienced periods of crying when her inappropriate behavior exceeded 60% of the time during a 20-minute period.

During intervention, Cathy’s inappropriate behavior ranged from 0% to 30% with a mean performance of 7.01%. During the four day data collection in other school settings (music and library), Cathy’s performance ranged from 0% to 40% with a median performance of 7.5% (mean = 12%). During a maintenance check 21 days later, she exhibited inappropriate behavior between 0-2%.

Social Validity
Any social skills intervention needs to directly address the needs of specific students (Heflin & Alaimo, 2007) and lead to improved social competence. Since the intervention is frequently implemented by the classroom teacher, it is also necessary that the classroom staff understand the relevance of the intervention and can describe how the intervention is developed. At the conclusion of the study, staff was asked a series of questions to note 1) their understanding of modified social stories as an intervention, 2) to describe how modified social stories are developed, and 3) to describe additional situations in which social stories or modified social stories may be used. The classroom teacher, paraprofessional, and speech clinician were interviewed separately by the first author and their comments were recorded. Upon completion of the interviews, the first author grouped responses into three areas: 1) can staff describe the guidelines of developing a social story and describe their purpose, 2) can staff describe how modified social stories are developed, and 3) can staff describe how social stories or modified social stories can be used in other situations.

In regards to the first and second questions,
all three professionals were able to describe the basic social story guidelines and describe the various types of sentences to be included (descriptive, directive, and perspective). Comments from the teacher, paraprofessional, and speech clinician indicated that they found modified social stories to be an effective intervention and would implement them with other students. In addition, they were able to identify how their present use of a modified social story differed from Gray’s original design. They each identified the presence of the color photographs and the use of the callouts as a way to “tweak the social stories and make them really appropriate for the students. . . .”

Comments also indicated that they could creatively identify further modifications that may render a modified social story even more effective. For example, the modified social stories in this study were produced in a laminated book format, 8 ½ inches by 11 inches. The paraprofessional had recently read about the use of Power Cards as an intervention to change behavior (Gagnon, 2001) and suggested a format change for the modified social stories based on Power Cards. Power Cards are typically the size of a trading card and utilize a student’s favorite character/object or obsession to improve behavior. Her suggestion was that the modified social story be created in a minibook format that would fit in the adolescent’s pocket.

Question three examined whether or not the staff could identify other situations in which a modified social story or social story may be used. Each professional listed situations in which further social stories could be used. The special education paraprofessional stated that she could “actually describe the bus situation . . . that would work . . . it could be like ‘when I’m sitting watching the buses, I get very excited. When I get excited, this is what I do . . .” Both the paraprofessional and teacher mentioned using social stories to address the issue of sexuality with their students. Although the teacher said she preferred to write her own stories, and felt comfortable doing so, she also found prepared social stories by Anne Marie Johnson also effective (Johnson & Susnik, 1995). She noted that other modified social stories, like those presented by Ann Marie Johnson are also valuable and that “students identify with characters in stories . . . the characters stayed in their minds and the content stayed in their minds . . . social stories generally work specific to target . . . a particular behavior.” She also believed that the color photographs worked well and that “they [the students] are fascinated by looking at themselves whether it be in the modified social story or in a video . . . and other students liked to see other students’ modified social stories as well [laughter].”

The speech clinician, while able to list the strengths of the modified social story, also recognized limitations. She thought that although social stories should be written as part of a collaborative team, she stated that it was frequently difficult to get teams together as is needed. She also believed that since the researcher came in from a university and could devote the time to consulting with the professionals, it made the design and development stage of the social story progress more smoothly. She wondered if it would be this easy without additional assistance.

Staff commented that it became increasingly difficult to implement social stories as the number of students requiring them increased. The teacher stated:

I have seven [students] . . . that’s an important piece . . . how are we going to implement it? I mean if the teacher is talking, are we going to stop to read the story? Staffing . . . . . . . that’s important . . . this population is very challenging . . . more than emotionally impaired or learning disabled.

The paraprofessional added:

On many days we just couldn’t . . . we couldn’t really drop what we were doing and read the book [when students needed it] . . . . they couldn’t read the book . . . the negative part is actually the time involved in reading the book when they can’t read . . . . and the [collecting data and] observations.

Additional comments reflected how the professionals enjoyed reading the modified social stories to the students. The special education paraprofessional, who implemented most of the stories, spoke enthusiastically about the modified social stories: “They are great! And I loved using the pictures . . . . they really noticed it was their picture . . . . I
didn’t think they would. That really helped.” She also thought that the use of the modified social stories provided an additional benefit in that it “let the child and me bond in some way . . . . I was the one that was reading them the stories when it came time . . . when they saw me come with the story they were welcoming . . . because they were personal . . . it had their pictures.”

Discussion

Overall findings from this study indicate that modified social stories with the use of color photographs were effective for the three participants and results were immediate and pronounced. The inappropriate behaviors decreased in other school settings and were maintained over extended periods without the use of their stories. The present study extends previously conducted research using modified social stories with individuals with autism in several ways. First, adolescents with autism were the participants. As noted earlier, most research exploring social stories has focused on children under the age of 10 (example, Haggerty et al., 2005; Ivey et al., 2004; Crozier & Tincani, 2005; Hagiwara & Myles, 1999). Second, the construction was modified in that actual photographs of the students were included in their modified social stories. It may be that the photographs enhanced the concreteness, meaningfulness and visual aspect for these adolescents with autism. It may also be that the perspective statements combined with the photographs facilitated understanding of the social situation for these students. Third, only positive instances of desired behaviors in the modified social stories were represented.

In this study, participants displayed cognitive impairments. The cognitive functioning of individuals with autism remains a mystery. It is unknown if the social-communicative deficit stems from an impairment in shared attention or information processing. Since rapid shifting of attention and shared attention seems problematic (Mundy, Sigman, & Kasari, 1994), then sustained focus on pictographic stimuli may be supported for use in interventions.

Studies that have focused on cognitive and social competencies of children with autism have noticed strengths in visual-perceptual skills (Rodgers, 2000; Siegel, J., Minshew, N., & Goldstein, 1996) and pictographic stimuli (O’Reilly, Sigafous, Lancioni, Edrisinha, & Andrews, 2005; Schmit, Alper, Raschke, & Ryndak, 2000; Bryan & Gast, 2000). Visual displays of skill sequences, in particular, have helped with skill acquisition of daily living skills (Charlop-Christy et al., 2000; Pierce & Schreibman, 1994).

A social story targets the behavior from a personalized view in very concrete terms then presents this story in a relaxed style. This procedure may help students understand the social context of their behavior, and the perspectives of others. Perhaps the social story serves to motivate the individual to perform the appropriate behavior, by demonstrating how it pleases other people. It may be that by personalizing a social situation with pictures, the social story enhances the concreteness and meaningfulness sufficiently to enhance understanding of appropriate social behavior. Quill (1997) suggests that visually cued instruction reflects the learning style strengths of individuals with autism. Their ability to maintain sustained attention to the pictographic stimuli “enhances the child’s attention to and encoding of the social-linguistic message.” (p. 708).

Teacher acceptance and understanding of the modified social stories is also important to note since limited research has elicited comments from staff in the use of the social story (Crozier & Tincani, 2005; Smith, 2004). While the participants demonstrated improved behaviors with the modified social stories, the teacher remained hesitant about creating them without outside assistance. The paraprofessional was more enthusiastic about their use and eagerly identified situations in which modified social stories could be used with adolescents. The concrete explanation of the desired behavior integrated with photographs of familiar individuals in the modified social story could apply to vocational situations and group home settings as well.

Limitations and Future Research

Previous studies implementing social stories have shown positive effects, but not universally for students with autism (e.g., Norris & Dat-
tilo, 1999; Staley, 2001). Although this study provides some positive effects for the use of modified social stories, limitations exist. Limitations involved the length of study phases, number of participants in a single class, and lack of baseline data in the other class settings. Only 11 weeks of data collection were permitted. Since a multiple baseline design was implemented, some participants received fewer than perhaps desirable days of intervention. As the three participants were in the same classroom, staff often appeared challenged with implementing all the modified social stories. Anecdotal notes and observations indicated that the behaviors occurred in other settings but baseline data were not collected in these settings; collection of generalization baseline data could help validate generalization effects. Generalization and maintenance phases should be extended to validate effectiveness outside of the classroom and over extended time. Although target behaviors were observed informally in a variety of settings for the three participants, baseline observation in the generalization settings could have provided precise measures of the extent of the other class setting effects. In addition, it is not known whether students achieved functional independence of the target behaviors. Further research could address these issues.

At present it is unclear precisely why social stories as previously presented by Gray and Garand or modified social stories, may be effective and what components of the social story package are most critical. Future research could examine more precisely the components of social stories. Are social stories more promising if presented through technology (Hagiwara & Myles, 1999), with photographs, or perhaps a comic strip presentation (Rogers & Myles, 2001)? Although limited research supports the use of social stories in the home (Lorimer et al., 2002), could they also be effective with older students in vocational settings? At present, many of these questions are still unknown and additional research is required.

References


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