

***The Effectiveness of Using a Social Story Intervention to Improve Social Interaction Skills of Students with Autism***

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***Abstract***

The aim of this study was to evaluate the effectiveness of using a social story intervention to improve social interaction skills in three students with autism aged between 7-8 years. A multiple-baseline-across participants design was used. To achieve the purpose of the study, the social stories were implemented. The intervention included reading the social story to the students, and answering questions based on what was read. The results of this study showed an increase in social interaction for all participants. The results suggest that the use of social story-only intervention without additional social skills interventions may be effective in increasing social interaction skills and the frequency of these skills.

***The Effectiveness of Using a Social Story Intervention to Improve Social Interaction Skills of Students with Autism***

Autism is a life-long developmental disability with neurological basis, it is characterized by a range of impairments in social functioning with social interaction difficulties in forming one of the main diagnostic criteria, alongside communication difficulties and lack of imagination (Nikopoulos & Keenan, 2007, Okada; Ohtake, & Yanagihara, 2010; Slahat, 2012).

Research into the experiences of children with social interaction difficulties has highlighted the increasing array of social situations faced as individuals aim for greater independence (Department of Health, 2009; Reynhout & Carter, 2010). The development of social interaction skills is a key indicator of student success in and out of the classroom (Klett & Turan, 2012; More, Sileo, Higgins, Tandy, & Tannock, 2013); a child's social skills impact their ability to relate to peers, make friends, and learn in a classroom setting. In fact, social competence has been identified as a foundation for school readiness and academic achievement as well as a better predictor of first-grade academic competence than family background or cognitive skills (Delano & Snell, 2006; Karkhaneh, Clark, Ospina, Smith, & Hartling, 2010, Ozdemir, 2008; Samuels & Stanfield, 2012 ). Difficulties with verbal and non-verbal communication, naming

skills, and language deficits may be considered significant barriers to social inclusion. Unfortunately, children with autism often experience difficulty in acquiring social skills and are likely to be less engaged with peers (Crozier & Tincan, 2007; Hutchins & Prelock, 2005).

Due to the importance of social skills for future success, it is important to identify evidence-based interventions that target the social skills of children with autism. There are a number of interventions available that promote learning and address the needs of children with autism. However, there is no specific intervention or method that has proved to be effective for all children with autism (Abdat, 2013).

Social stories are based on the premise that people with autism have difficulty to read and understand social cues and situations. Social stories were first developed by Carol Gray in 1991, as a strategy for developing social understanding in children with autism by sharing information about a variety of concepts, interactions and situations in a meaningful and accurate way (Samuels & Stanfield, 2012, Scattone, 2008; Sonenksen, & Alper, 2006; Test, Richter, Knight, & Sponner, 2011,). The aim of the stories is to explain confusing social situations through text and visual support. Social stories are tailored, briefed and written from the perspective of the person who will benefit from them. Stories may describe what is involved and the sequence of events that need to occur to successfully navigate a social situation. They may describe the thoughts and feelings of others in the setting. In addition, they often offer suggestions concerning how to respond in the situation. Gray (2004) suggests that social stories can improve the ability of the person to see things from another's perspective and help integrate information into a meaningful from.

Social stories differ from direct social skills instruction by offering explanations to support the person's understanding and interpretation of what is expected within a specific environment. More et al (2013) note that while a social story may coach an individual to manage effectively in a specific situation, it will not necessarily generalize to other similar situations. This is an important consideration when evaluating the success of the intervention.

Social stories have a key set of features described in checklist by Gray (1995, 2004). She recommended that social stories contain two categories of sentences, those that describe and those that direct. Sentences that describe include descriptive (e.g. when the bell rings, it is time to go), perspective (e.g. sometimes people feel sad), affirmative (e.g. listening is a good thing to do), and cooperative (e.g. When get scared, people can help me) sentences. Sentences that direct include directive sentences (e.g. I may ask my teacher for help) and control (e.g. If I get scared, I can ask for help). Social stories have been shown to successfully improve social skills for children with autism (Chan, Reilly, Lang, Boutot, White, Pierce, & Baker, 2010; Cihak, Killdare, Smith, McMahon, & Quinn-Brown, 2012; Leaf, et al., 2012; Litras, Moore, & Anderson, 2010; Wang & Spillane, 2009).

In a review of research literature on social stories for students with autism. Researchers (e.g. Abdat, 2013; Al Jarhai, 2004; Chan, et al., 2010; Cihac et al., 2012; Fatiha, 2012; Leaf, 2012; Litras, et al., 2010; Mohammed & Hassen, 2013; Sansosti & Power-Smith, 2008) have demonstrated positive change in a wide range of social skills. A social story can reveal accurate social information in a clear and reassuring manner that is easily understood by children with

autism. The improved understanding of the events and expectations can lead to a change in the behavior (Ali & Fredericksonm, 2006). Some of social stories interventions have been implemented in the classroom setting (Adamz, Gouvousis, VanLue, & Waldron, 2004, Chan, et al., 2010; Chan, & O'Reilly, 2008), and others in home environment (Ivey, Heflin, and Alberto, 2004).

Several studies lacked demonstration of experimental control (Agosta, Graetz, Mastropieri, & Scruggs, 2004; Hanley, Bray, Kehle & Elinoff, 2010, Sahfalah Center, 2013). Adamz et al., (2004) did not describe the participants' selection criteria. Other studies did not assess generalization effects (Quilty, 2007). Other studies included interventions in addition to social stories (Cihak et al., 2012; Ganz, et al., 2012; Litras et al., 2010; Sansosit & Powell-Smith, 2008).

Although an increasing amount of literature suggests that social stories can be effective for students with autism to improve their social interaction skills, many lack rigorous methodological standards and use the social story intervention in conjunction with other treatments, making difficult to identify the source of the behavior change. Additional empirical social story research is essential to further develop this promising intervention in the field of autism (Ganz, et al., 2012; Litras et al., 2010).

The purpose of this study was to evaluate the effectiveness of using a social story intervention to improve social interaction of students with autism. This study adds to the literature by evaluating the use of social stories to improve social interaction in Arabic countries. The following research question for this study was addressed "Does social story intervention improve social interaction skills for students with autism?"

## ***Method***

### **Participants**

The participants for this study were recruited through a special education center. Three male students diagnosed with autism (Ali, Mohammed, & Sultan) participated in this study. To confirm diagnosis, the participants were also assessed by the researcher using the Autistic Behavior Checklist, (ABC; Arabic version, Al Zarah, 2005). The ABC is a checklist focused on the social behavior of the child and provides a standard score. The special education teacher completed the ABC for the three students. All the students got a low score in the domain of social skills. Participation criteria included the following:

1. They had been diagnosed with autism and were being served in a special education classroom;
2. Written consent was obtained from the parents of the participants needed;
3. They were between age 7-8 years;
4. They did not receive interventions in the past;
5. They had deficit in social interaction skills.

(Ali). Ali was 7 years of age with autism. He lived with his parents. He attended a classroom for students with autism. Ali had been evaluated and diagnosed with autism at 4 years. His teacher reported that Ali mostly played alone with no favorite peers. He had difficulty initiating and

responding to conversation, playing with others, making eye contact, and interacting appropriately with others. Ali communicated mostly using simple sentences.

*(Mohammed)*. Mohammed was 8 years of age with autism. He lived in a single-parent home with his mother. He had been diagnosed with autism at age 3 years. He could not speak in complete sentences. He displayed limited interactions with other children, he did not develop relationships with others. Mohammed also lacked eye contact and sometimes he followed set patterns of behavior in his interactions with others. He preferred to play alone and had difficulties initiating any social interaction.

*(Sultan)*. Sultan was 8 years and 4 months of age with autism. He lived with his parents. His teacher reported that Sultan had difficulty initiating and interacting with peers, following directions, making eye contact, engaging in social interaction, and using gestures. He showed a lack of interest in toys. He preferred to play alone and did not seem notice peers in the classroom. He had also difficulties understanding facial expression.

### **Setting**

The study was conducted at special education center located in Al Ain city in United Arab Emirates. Classes were comprised of students with different disabilities (e.g., mental retardation, autism) and as well as by age groupings for students with sensory impairments Attention Deficits Hyperactivity Disorders. Although, the participants were in the same classroom. All intervention sessions and observations took place during free play in the play room because this was the time and settings for all participants were together.

### **Social stories**

After the participants had been selected, teacher and parent interviews were conducted to identify possible behaviors for intervention. The researcher met with the teacher and explained the social story intervention and provided an example of a social story. Then, the teacher was asked to identify activities during the school day that were challenging to the teacher.

The teacher identified three target behaviors for each participant based on the following criteria:

1. These behaviors interfered with the development of peer relationships appropriate to developmental level;
2. Deficits in nonverbal behaviors such as eye contact, and facial expression interfered with social interaction;
3. The behaviors targeted in this study were also consistent with each child's individualized education program (IEP);
4. These behaviors interfered with learning;
5. These behaviors were not being addressed through another targeted intervention.

After the initial teacher interview, the researcher conducted two classroom observations for each participant to verify the target behaviors. Observations took place in the play room. Based on the information from the teacher's interview and student observation, two social stories were written for each student according to Gray's (2004) criteria and included descriptive, perspective, and directive sentences. The content of social stories typically tell what is going to happen in social

situations and attempt to describe why these situations happen. These stories also help the child to understand the multiple perspectives that can exist in a social situation (Gray, 2004). To ensure the social stories met the criteria described by Gray (2004), a two-step validation process was used. First, the stories were reviewed by two early childhood professors at UAE University to ascertain their compliance with Gray's Criteria and checked for social validity. Then, the stories were reviewed by two early childhood teachers and two special education teachers. Those teachers checked for age appropriateness and applicability to those participants. The pages of each story were typed on white paper. The title was in 28-point and the story was in 16-point Times New Roman font. Pictures were taken from *Stories for Children with Autism* (Abdat, 2013).

### **Experimental design**

A multiple baseline design across participants was used to assess the changes in social interaction for students with autism. This design required the intervention to be implemented in across participants so that each participant serves as control for another participant (Kazdin, 2010). If desired behavior change was evident when and only when the intervention was initiated and this was replicated across three participants, one can be reasonably confident this behavior change was a function of social story intervention.

### **Baseline**

During the baseline, the participants engaged in the typical classroom routine. Observational data were recorded for each participant. No intervention occurred during the baseline period.

### **Target behavior**

Before the class started, Ali was allowed to go to the play room to play games. The dependent variable for Ali was preparing to leave the play room in an appropriate way. An appropriate behavior was defined as (a) getting his bag, (b) moving away and (c) walking toward the line at the door. Inappropriate behavior was defined as wandering around the room than the direction of the door. The dependent variable for Mohammed and Sultan was behaving appropriately during circle time. An appropriate behavior was defined as (a) responding when asked by the teacher to respond, (b) playing with peer without hitting, (c) asking questions related to ongoing activities, and following directions. An inappropriate behavior was defined as (a) speaking without raising hands, (b) lying on the ground, and (c) not following directions.

Targeted behaviors were coded 10 seconds for Ali and every 15 seconds during 5-minute intervals for Mohammed and Sultan. If the participants demonstrated every targeted behavior in an appropriate manner during the interval, correct responses were recorded with (+). If the participant demonstrated the targeted behavior in an inappropriate manner during the interval, responses were marked with (-). Each targeted behavior was graphed as a percentage of intervals during each session for each participant.

### **Reliability**

Reliability was checked on 25% of the observations by another teacher, who was trained over the sessions. The researcher and the teachers coded the behaviors of all participants. Reliability was above 85%. Reliability was calculated by dividing the number of agreements by the number of

disagreements plus agreements. Inter-observer agreements for Ali was 90, for Mohammed it was 88, and 92% for Sultan.

### **Intervention**

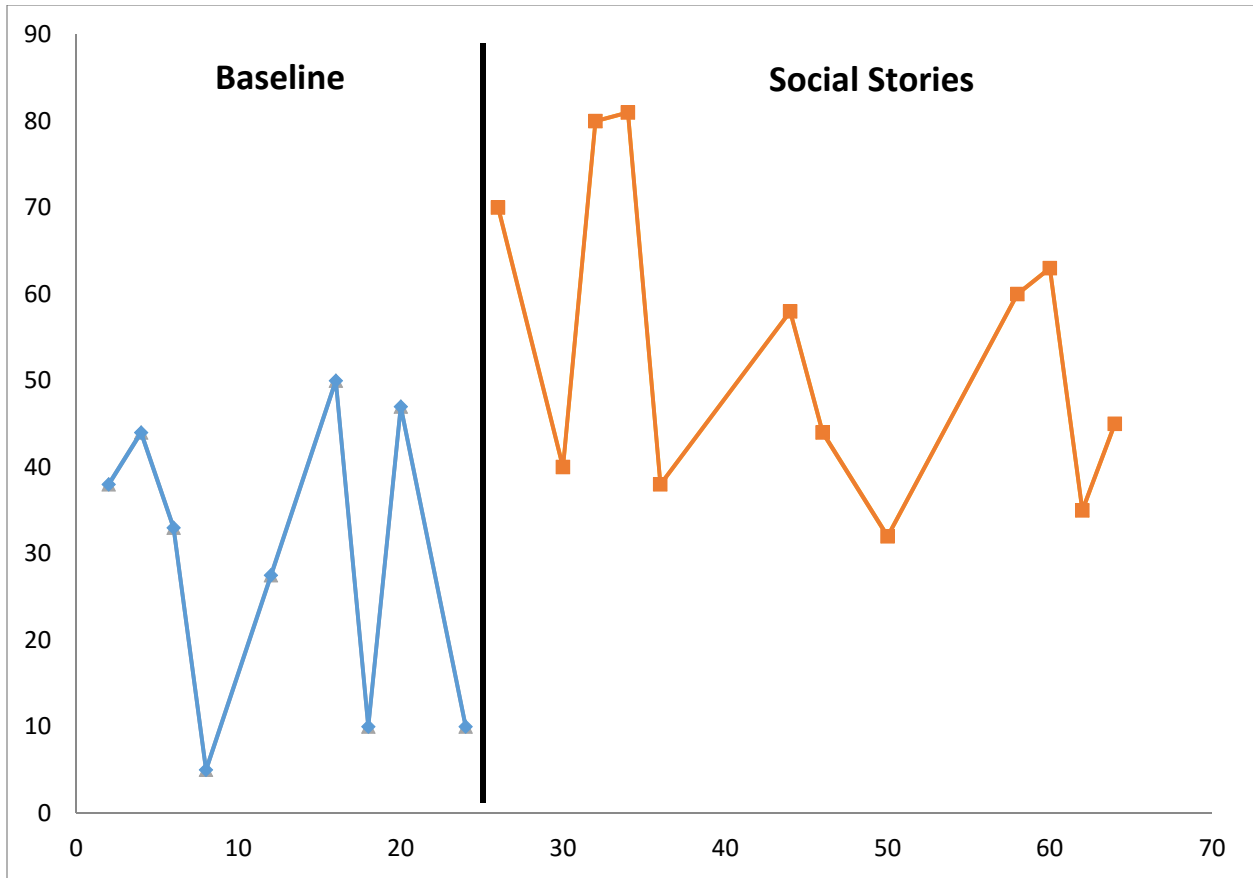
Intervention data were collected three times a week for five weeks. Each intervention session was 10 minutes in duration. Two social stories were written for each student. The social story included information about the targeted behavior (e.g., listening to the classroom teacher, sitting in circle) and where the routine occurred. In the beginning of each session, a social story which described the day's activity was read by the teacher. During the intervention, the student sat across from the teacher and the story was placed in front of the child. The teacher read the social story to the participant each day immediately before the routine that was targeted (e.g., circle time, morning bell). The child was then asked questions regarding what they would do next (e.g., what will you do when it is time for circle?). The researcher then observed the targeted routine but direct interactions with the child did not occur. If the child correctly answered the question, the teacher said, that's right. If the child incorrectly answered the question, the teacher opened the story to the correct response and stated the correct response. The teacher did not provide any other reinforcement during the social story reading.

### ***Results***

Overall there was an increase in social interaction behaviors across all participants. The results are discussed for each participant:

#### **Ali**

Appropriate social interactions for Ali did change after the introduction of the social story. The mean frequency of on-task (target) behavior or preparing to leave the play room to his classroom in an appropriate way during the baseline was 27% (range = 5-50). During social story intervention, the mean frequency was 50% (range = 31-81).

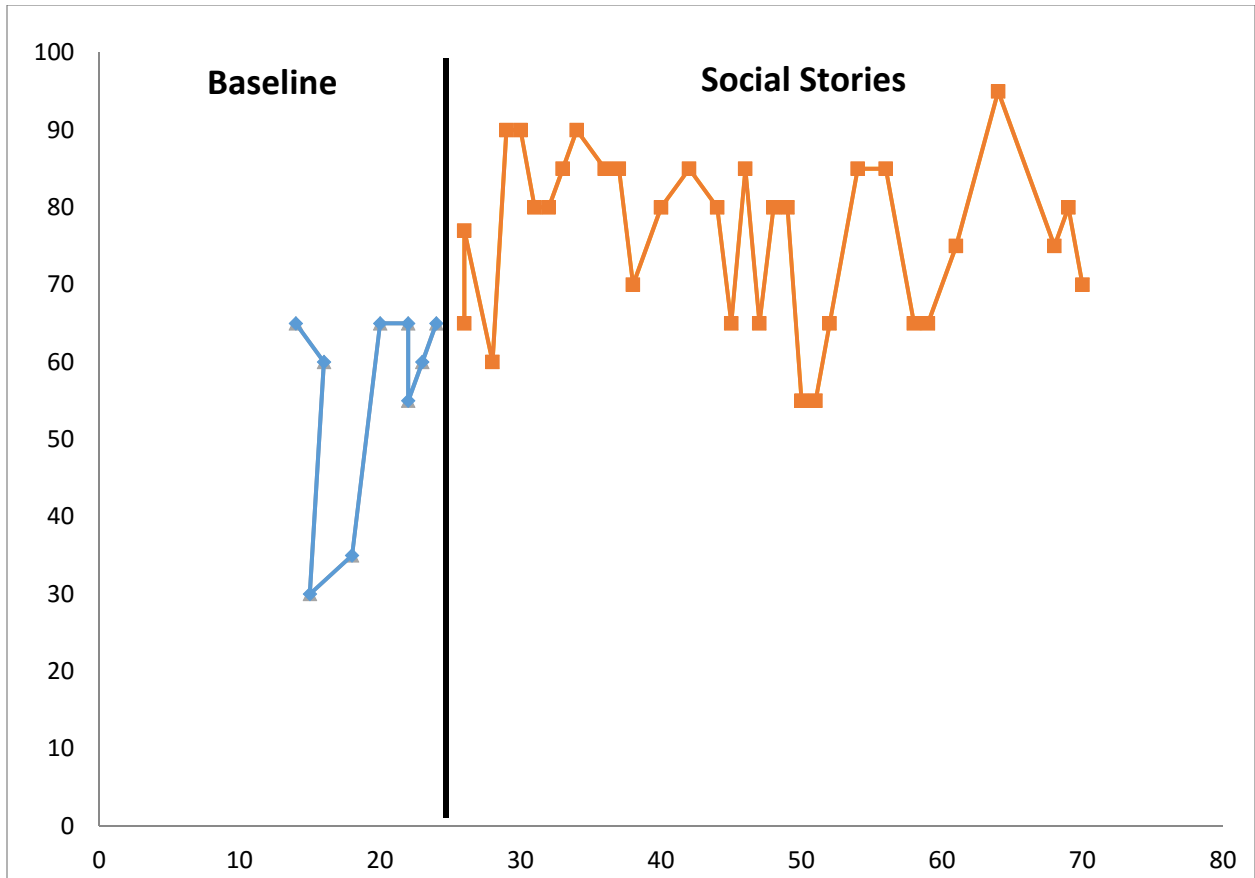


**Figure 1**

**Sessions**

**Mohammed**

Mohammed demonstrated the largest increase in appropriate social interaction during intervention. For Mohammed, appropriate social interactions was 56% (range 30-60) during baseline. During social story intervention, the mean frequency was 79% (range = 55-95).



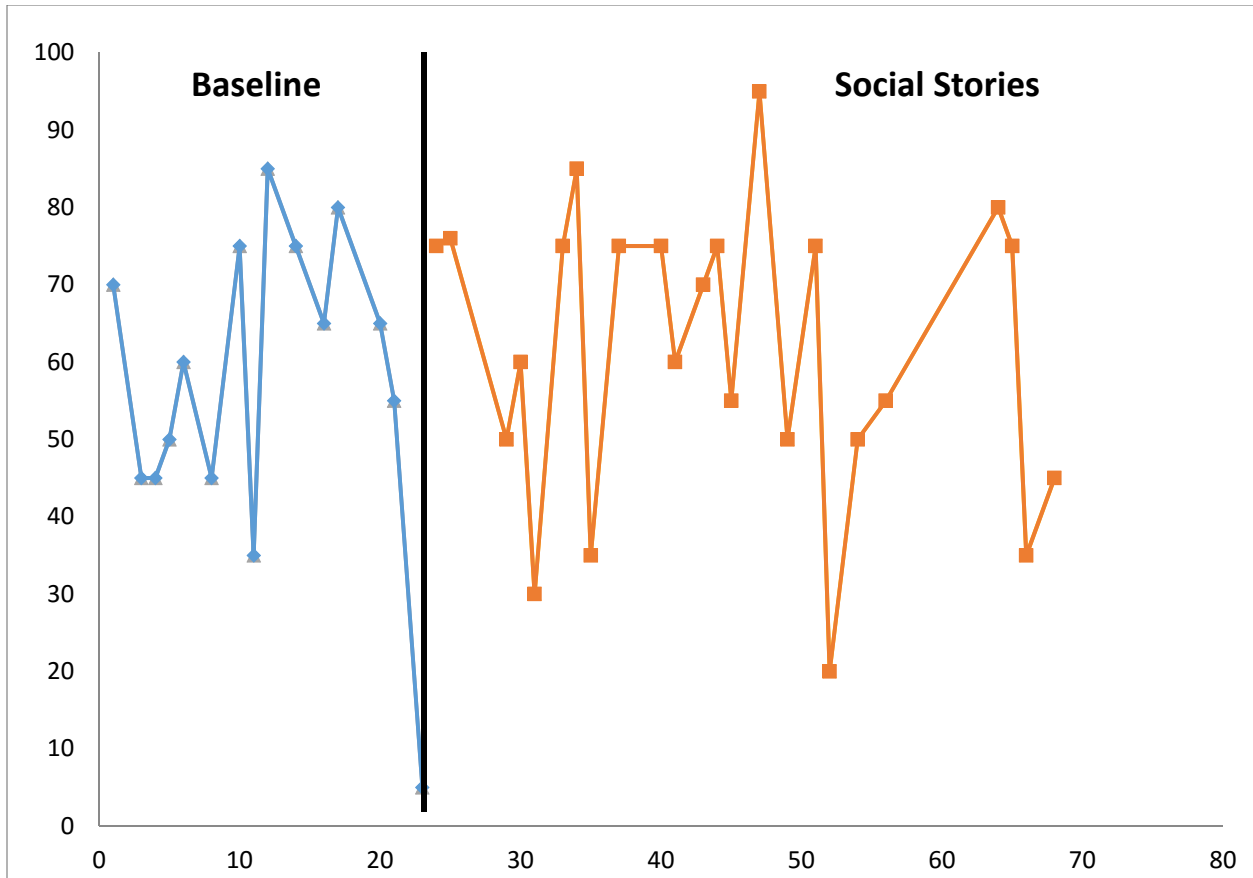
**Figure 1**

**Sessions**

**Sultan**

Sultan's behavior was highly variable during baseline, the mean frequency of appropriate behavior during circle time for Sultan was 59% (range = 5-95), the mean frequency was 73% (range = 40-90).





**Figure 3**

**Sessions**

**Maintenance**

Six weeks following the end of intervention, data for two maintenance sessions were recorded. Each participant maintained the level of behavior shown in for the previous intervention. This is further evidence of the effectiveness of the intervention

*Discussion*

Results of this study partially replicate previous research, which found positive effects for social stories with children with autism (Abdat, 2013; Cihake et al., 2012; Litras e tal., 2010. This study demonstrated that social stories, presented as an auditory-visual support system, were effective in increasing social interaction in three children with autism. Possibly the most interesting and significant aspect of this study is a visual analysis of the data, which clearly shows that the participants benefited from the intervention. As expected, after the participants were given information on how to respond to or act in a social situation, they were able to perform more

appropriately. It also supports the literature proposing visual supports to be efficacious in curbing challenging behaviors in children with a developmental delay.

The study confirms the results of the few other experimental studies (Chan, et al., 2010; Cihak, et al., 2012; Leaf, et al., 2012; Litras, et al., 2010; Wang & Spillane, 2009) that also implemented social stories as the only intervention for a problematic behavior. Unfortunately, three of these studies (Mancil, Haydon, & Whitby, 2009; Koknia & Kern, 2010) implemented social stories after exhausting other treatments that were ineffective. The positive results of these studies may have been due to the unique combination of treatments which ended with social stories. Adamz et al. (2004) used social stories as the sole intervention using an ABAB design with one child. The present study is most consistent with the results of Klett & Turan (2012) and Hanley, et al., (2010). The researchers implemented a multiple baseline design across three participants and used social stories as the sole intervention. The main difference between the two studies was the design of the social stories. Klett and Turan (2012) and Hanley, et al., (2010) used a 'written script' and did not incorporate pictures. The present study included two children in the same classroom. Participant 3, who received the intervention last, was able to hear the social story being read to Participant 1 who received the intervention first. The results show that for the first two days after the intervention was implemented with Ali, Sultan inappropriate behavior decreased. With regard to the overall efficacy of the social stories, the greatest increase occurred for Mohammed, whose social interaction improved from a mean of 56 to a mean of 79. His targeted behavior was a sequence, which had to be completed in a certain order (i.e., leave paly room, get his bag, line up). Sultan demonstrated a modest improvement form baseline to intervention from a mean of 59 to a mean of 73. Ali, on the other hand, demonstrated the lowest improvements from a mean of 27 to a mean of 50. Immediate treatment effectiveness was observed for Mohammed, whose target behavior consisted of appropriate social interaction during circle time. During baseline, Mohammed motivated to interact, as he did not isolate himself during circle time. After the introduction of the social story, appropriate interactions increased as he initiated playing with pees without hitting, a behavior he had not played without hitting during baseline. He also started to raise his hand and wait for his teacher to call on him. On occasion, if the teacher was not looking at him when he raised his hand he would say, "Excuse me." He looked at the teacher more often and participated during the parts of circle time.

Improvements for Sultan, whose social behavior during baseline included inappropriate interactions (.e.g., lying on the ground, and speaking without razing hand). After the introduction of the social story, he looked at the teacher more often, responded when called on, and participated in the reading curriculum but would speak out of turn on occasion. In contrast, the social story had little effect on Ali's behavior regarding responding to the conversation and interacting with others. One possible explanation for the little effect for Ali may be considered as his weak and communication and his low motivation to engage in social behavior with peers. He has also a problem with the eye contact. In addition, the data from the maintenance indicated that the effects of social stories may be maintained overtime. In fact Leaf et al., (2012) documented maintenance of most of the newly acquired social interaction skills taught. Educationally, the use of social stories is appealing for a number of reasons. First, these stories are easy to produce. Second, the process of writing story is

not time-consuming. Finally, the results of this study suggest that changes in increasing social skills by using social stories may occur quite quickly.

A limitation of this study is that the researchers were unable to control a number of potentially confounding variables. For example, it was not possible to control the participants' morning schedule before they arrived at school or how other students interacted with them as they arrived. In addition, the timing of the training sessions was possibly a limitation as well. Due to time constraints, it was not possible to present the training before the participants had a chance to greet the teachers every morning. It would be desirable to provide the training immediately before the greeting opportunity as they could have facilitated performance of the targeted behavior.

The age of the participants may also influence the story's effectiveness. Mohammed was 8 years old and Sultan was 8 and 4 months old.

### *Future Directions*

There remain a number of unanswered questions that still need to be addressed. Students with autism display a wide range of abilities. Intervention should be tailored to individual students, further information is needed to determine the optimal parameters of social story intervention. Gray (2004) does not specify the number of times a story needs to be read to be effective. Future research can address effectiveness between stories that are read numerous times a day versus once a day (or less) as well as how long the intervention lasts. The time of day the social story is read may also be addressed (e.g., immediately prior to the situation versus during the situation). Subsequent research may reveal the effects of reading different stories directed at the same behaviors. Future investigations also can examine the additive social stories when combined with other interventions (e.g., rewards systems, video feedback, using iPad to teach social skills). Although the social stories were effective for Mohammed and Sultan, effectiveness may have increased of the participants if they had additional components.

### *Conclusion*

In conclusion, the study replicated and extended the literature by demonstrating that social stories appear to be effective when addressing social interaction difficulties for students with autism. The results of the study indicated all three participants demonstrated an increase in the targeted behavior after social story intervention was implemented even after the intervention was finished, which suggests learning of appropriate social interaction during the introduction of the social story. Social stories appear to hold promise for assisting individuals with disabilities in general and with autism in specific by providing social information they may be lacking.

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