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The Effect of Social Stories intervention Technique on Self Management of Eating Behavior of a Child with Autism

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Abstract

This study explores whether or not Social Stories Intervention Strategy have positive effects on the eating behavior of a girl child with autism. Method. A girl child diagnosed as having autism disorder participated in the study. A pre- post- follow up design was used to examine the effectiveness of the social stories Intervention Strategy on the eating behavior of the target child. Results. Findings from this study indicated the effectiveness of the social stories intervention employed in teaching the target child self management of eating. Discussion. On the basis of the findings, the study advocated for the effectiveness of the social stories intervention employed in teaching the target child self management of eating.

***Keywords*:** Social stories, eating, Social Stories Intervention Strategy, autism

A social story is an individualized short story that describes social relevant cues in any given situation. It breaks down a challenging social situation into understandable steps by omitting irrelevant information and by being highly descriptive to help an individual with ASD understand the entirety of a situation. It includes answers to questions such as who, what, when, where, and why in social situations through the use of visuals and written text (Scattone et al., 2002). A social story reveals accurate social information in a clear and reassuring manner that is easily understood by the individual with an ASD. The improved understanding of the events and expectations may lead to a change in behavior (Ali and Frederickson, 2006). Experience indicates social stories are often effective with mid to higher functioning students with ASD, and may be applicable to students with other learning impairments as well. They serve as visual supports that are reported to be useful in educational program for children with autism who have difficulty in processing and comprehending spoken language and social communications (Lal, 2010).

A growing body of literature has examined the effectiveness of social stories with individuals with autism. Existing literature showed that social stories were effective in decreasing aggressive behavior (Adams, Gouvousis, Van Lue, & Waldron, 2004; Gray & Garand, 1993; Romano, 2002; Rowe, 1999), increasing appropriate behaviors (Agosta, Graetz, Mastropieri, & Scruggs, 2004; Cullain, 2000; Graetz, 2003; Kuoch & Mirenda, 2003, Smith, 2001), increasing the use of appropriate social skills (Barry & Burley 2004; Hagiwara, 1998; Pettigrew, 1998), increasing greeting behavior and initiation of play activities (Feinberg, 2001), increasing on-task behavior (Brownell, 2002), increasing appropriate meal-eating behavior (Staley, 2001) and decreasing precursors of tantrum behaviors (Simpson & Myles, 2002).

Therefore the purpose of this study is to expand the scope of research on the use of a Social Story to teach self management of eating behavior of a child with autism. The present paper addresses the following question :

1. Does the use of the social stories intervention strategy have a positive effect on self management of eating behavior of the target child ?

Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) represents a severe form of a pervasive developmental disorder which is characterized by impairments in social relationships and communication skills and which often is accompanied by the "presence of unusual activities and interests such as rituals, stereotypes, and poor play skills" (Batshaw, 1997, p. 425). ASD is often referred to as a "spectrum disorder," which describes the variety of symptoms and severity that may be present within the individual (Tanguay, 2000). Neurologists, neuropsychologists, and other qualified professionals utilize the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) of the American Psychiatric Association to diagnose ASD. "The essential features necessary for the diagnosis of autistic disorder include 'the presence of markedly abnormal or impaired development in social interaction and communication and a markedly restricted repertoire of activity and interests'" (Scott, Clark & Brady, 2000, p.66).

By definition, symptoms of autism appear prior to age 3, however some children may not be diagnosed until they are school age (Batshaw, 1997). Autism is included as one of the educational categories that may qualify students, who present an educational need, for special education services under the federal IDEA law. "This definition, and every other definition of autism is a description of symptoms.

As such, autism is recognized as a syndrome, not a disease in the traditional sense of the word. Although autism is defined and assessed by observing behavioral characteristics, it is not considered a behavioral, an emotional, or a conduct disorder, or a mental illness" (Shriver, Allen & Mathews, 1999, p. 539).

Social Stories

The use of social stories is a method that is increasingly suggested for improving social skills of children with autism . The rationale of social stories is based on the growing body of empirical evidence which reveals these affected children's innate inability to "read" social cues and perspectives of others, and their difficulty in interpreting the meaning of an event as a whole from diverse pieces of information (Gray, 1998). As first described by Gray and Garand (1993), social stories are "short stories that describe social situations in terms of relevant social cues and often define appropriate responses" (p.1).

In other words, social stories are designed to provide children with autism with the information they are missing (Kuoch & Mirenda, 2003). The technique is used to assist these individuals in understanding and interpreting challenging or confusing social situations by providing them with important social cues and increasing their awareness and understanding of the who, what, when, where, and why of social situations (Sansosti, Powell-Smith, & Kincaid, 2004). Appropriate responses are expected to be formulated on their own after having an accurate understanding of situations.

Effectiveness of Social Stories

Social stories are basically applicable to any situations in school, home, and community settings (Gray & Garand, 1993). A number of clinical case studies and scientific research have been carried out in these environments to examine the efficacy of the technique on children with autism or other subcategories under the umbrella of Pervasive Developmental Disorders who have a variety of social and behavioral needs.

Research on Social Stories

In a study conducted by Scattone, Wilczynski, Edwards, and Rabian (2002), three students of varying ages participated. All were capable of communication using speech and all were in self-contained classrooms. The authors utilized a multiple baseline across subjects design to evaluate the impact of the social stories on the percentage of intervals in which staring, shouting, and chair tipping were observed by the experimenters.

Two subjects read the story aloud to an adult and one subject had the story read to him each day by an adult in the classroom. In addition, the stories were available for the students to look at or re-read throughout the day. A visual examination of the results showed that two of the three subjects decreased inappropriate behaviors during the social stories intervention condition. The third subject displayed such a low percentage of inappropriate behavior during baseline that minimal change was seen during the treatment, and initial decreases in inappropriate behavior were actually seen prior to implementation of the social story. In the discussion to this paper, the authors report that teachers were observed to provide prompts for behaviors related to the targets in the social stories. This additional variable, not controlled for in any way, completely invalidates the results of the study. This is a problem described by several authors. Treatment integrity was reportedly very high, although anecdotal reports appear to contradict this (e.g., one

student was observed to be reading another student's story, a second student read the story multiple times per day, a third student was incredibly resistant to the story and refused it on several occasions). While the classroom staff may have attempted to implement the intervention consistently, the authors actually report quite a bit of variability in terms of frequency of contact with the stories.

Adams, Gouvousis, VanLue, and Waldron (2004) utilized a reversal design to evaluate the effectiveness of a social story intervention to decrease crying, falling, screaming, and hitting in a seven-year-old male with autism. One story was written, following the social story formula, in which the subject was encouraged to engage in behaviors intended to alleviate the motivating variables responsible for the target behaviors. For example, the story instructed the subject to ask for help or a break. Baseline and intervention data overlap with great variability for all four conditions with no demonstrable change in the dependent variables. Data on acquisition of the "replacement" behaviors of asking for help and requesting breaks would have been beneficial to this study given the lack of response to intervention for the behaviors targeted for reduction.

Delano and Snell (2006) utilized a multiple baseline across subjects research design to evaluate the use of social stories to increase the duration of social engagement and frequency of four separate appropriate social responses for three children with autism. This study employed peer confederates for the intervention (one peer for initial intervention and a second peer for generalization). Prior to baseline the authors conducted brief preference and academic assessments.

The reinforcer assessment was needed to identify preferred play activities for the intervention sessions. The academic assessments were conducted to evaluate the comprehension level of each subject to assist in development of the stories and to determine the most appropriate delivery method. The authors report that all stories adhered to the basic social story ratio suggested by Gray and Garand (1993).

Delano and Snell used a more innovative baseline method in which nonrelated stories were read to the subjects and confederates and a question and answer period followed in which comprehension questions were asked of the subjects. This procedure set the stage for a similar practice during intervention. During both baseline and intervention, after story time, the subject and confederate were allowed to play for 10 minutes. During this time, data were collected on the duration of a variety of social behaviors. Additional probe data were collected in the time immediately prior to story time. In addition to the unusual baseline, the authors actually programmed fading criteria for limiting the frequency of story sessions and conducted generalization probes with lesser known peers.

Visual analysis of the data indicates that the intervention was effective for one subject, with increases in social engagement increasing from about 50 seconds in ten minutes to 450 seconds throughout the treatment condition, and maintaining at about 200 seconds across the fading and generalization conditions. Data for the other two subjects appear to be far more variable and therefore more difficult to interpret. One of the two remaining subjects demonstrated a steady increase in social engagement during the training condition, but fading and maintenance data are not as convincing as the first subject. Similar results are found with the third subject, with the exception that social engagement did not generalize to the novel peer. The steady increase in duration of social engagement is interesting and indicates that some other factor, such as increased reinforcement from the peer as a result of social engagement, may be influencing the target behavior. Additionally, the authors report that two of the three subjects (1 and 3) received additional discrete trial training on language and social skills.

Kuoch and Mirenda (2003) examined social stories without prompts for two subjects and compared social stories to prompts for a third subject. Subjects were between 3 and 6 years of age, representing some of the youngest subjects studied thus far. Three very different target behaviors were identified for each subject (i.e., aggression, spitting food out or other disruptive

mealtime behaviors, and sharing/cheating), requiring three different social stories, one for each subject. For two subjects, an ABA design was used and for the third subject an ACABA design was used. The social story condition (B) consisted of the story being read by an adult sitting behind and to the side of the subject. No comprehension questions were asked. The target behavior was "corrected" by an adult if it occurred in the session time immediately following the social story. This correction procedure was in place during baseline.

The prompts condition (C) was designed in a manner intended to rule out the effects of individual attention that naturally accompanies reading a social story. The authors designed this condition so that a fiction story was read to the subject and then a prompt was delivered related to the target behavior. For this subject, the experimenters incorporated a prompt regarding the target behavior at the end of the reading of the social story as well.

Story construction for the first two subjects generally adhered to the social story guidelines, but the third story was generally more complex than recommended by Gray and Garand (1993). Visual analysis of the data for the two ABA subjects indicates a lack of experimental control as neither subject showed a reversal in responding rates when baseline was reintroduced. In addition, rates of the target behavior were already decreasing in the initial baseline for subject two before intervention began. Analysis of the data for subject three (ACABA) indicated that the prompts plus fiction story condition produced rates of responding similar to baselines one and two. Inappropriate behaviors reduced in the social story condition and remained low when the third baseline was introduced. Kuoch and Mirenda (2003 found that prompting alone was insufficient for behavior to change, however the prompts delivered were separated from the target behavior by time and space. The following section evaluates studies where reinforcement, another key variable in behavior analytic intervention, is added to the social stories protocol.

Crozier and Tincani (2007) examined the effectiveness of three different social story interventions for three preschool children with autism. Sitting appropriately during circle time, talking appropriately with peers during snack time, and increasing appropriate play (while decreasing inappropriate play) were addressed with three separate stories; one story (target behavior) per participant was evaluated. A simple reversal design (ABAB) was used for two participants and an ABCACBC design was used for the third. This design was chosen after the participant did not respond to the social story when presented alone.

Visual analysis of the data for each participant indicates that the authors were able to show that social stories alone increased engagement in target behaviors for two participants, however shortcomings should be noted. First, for the participant whose story addressed sitting nicely in circle, a slight uptrend in the behavior was observed in the initial baseline. However, the behavior did increase dramatically and remained stable when the social story was implemented. However, the sitting behavior did not completely return to baseline levels during the reversal. In the case of the second participant who experienced a simple reversal design, increases in appropriate play (along with concurrent decreases in inappropriate play) were observed in the initial social story condition, however the behavior did not completely reverse and much higher rates of appropriate play weren't seen until the second social story alone condition. These results challenge the hypothesis that social stories alone could have been completely responsible for the behavior change observed.

The third participant experienced the ABCACBC design. For this subject, responding in the social story alone was almost identical to the initial baseline condition. The experimenters added prompts, delivering then to the participant on a variable interval schedule averaging about 2 prompts per minute. In a tenminute session approximately twenty prompts were delivered. Frequency of talking to peers increased to about five to six occurrences per session in this condition. A successful reversal followed, followed by a much more successful social story plus prompts condition (about 10 episodes of talking to peers per session were recorded). However this condition lasted only two sessions. The social story alone was attempted again, with

baseline-like responding observed. A final social story plus prompts condition occurred, once again with only two sessions, with 4 and 8 episodes of the target behavior being recorded respectively.

This study does include a maintenance phase, where the experimenters trained the classroom staff on the social story intervention and turned the treatment over to the teachers. Data from two maintenance probes shows responding similar to the treatment condition for one of the three subjects. The other two subjects' data were much closer to baseline levels during the maintenance probes. Observations and questions from the experimenters showed that only one of the three students frequently accessed his story during the maintenance phase. This subject was the one for whom the maintenance data showed high rates of the target behavior.

This study adds to the social story literature by comparing social stories plus prompts to a condition without prompts. Further analysis is needed by the authors of this study to closely examine what it was about their subject that made the social story alone ineffective, when at least moderate results were seen for the other two subjects.

Kuttler, Smith Myles, and Carlson (1998) focused on decreasing precursors to tantrums in a single participant with autism. They used a reversal design in two different settings to evaluate the effects of the story on a variety of behaviors that had been observed to occur before tantrums. The authors report that tantrums were more likely to occur during transitions, when the subject had to wait, and during free time. While this is clearly not a comprehensive assessment, the authors did at least attempt to identify antecedent variables to the target behaviors.

Two different social stories were written that addressed appropriate behaviors for different times of day (morning work and lunchtime). The stories differ from the traditional story in that they identify a specific reinforcer for appropriate behavior during the activities identified in the stories. The authors do not report the length of observation sessions, however the data indicate a functional relationship between the social story intervention and the decrease in precursor behaviors. In fact, graphs for both settings (lunch and work time) show an immediate decrease in inappropriate behaviors to zero or near zero levels. Expected changes in behavior across conditions were seen for both reversals. These data question to what extent behavior change could be attributed to the story or to the reinforcement. One final obvious limitation to this study- the use of only one subject- does present additional problems for external validity.

Barry and Burlew (2004) examined social stories as an intervention to increase play skills in two elementary students with autism. The authors measured the number of prompts required to get each student to engage in play skills and the duration of play time for each subject. A multiple baseline across subjects with three different treatment conditions design was used to evaluate the intervention (ABCD). In this study, social stories were not presented as a single intervention until the last phase. In Phases B and C varying levels of teacher intervention accompanied the social stories (prompts, practice, and praise). In Phase D, stories were available for the students to look at, and were read to the participants once each morning. Visual analysis of the data indicates that the intervention package was successful as the number of prompts required to start play decreased across conditions and duration of play increased across conditions.

The purpose of my present study was to evaluate the effects of a Social Story to teach self management of eating behavior of a child with autism that would also prevent her from choking.

Method

Participants

A girl child named Ola diagnosed as having autism disorder participated in the study. The child also had the following characteristics: (a) meet the full criteria for autism according to the Screening For autism Scale (Adel Abdullah, 2006), and (b) ability to follow directions .

During informal observations at mealtime , Ola exhibited some aversive, syndrome related characteristics, (Ledford & Gast, 2006), including food refusal and sensory-based eating problems. However, the main issue was that Ola stuffed her mouth with food when she was not watched and prompted to take small mouthfuls. Ola would put another piece of food in her mouth when her mouth was still filled with food. When her mouth was filled with too much food, Ola could not chew and gagged as a result.

Ola always had an adult (her teacher) next to her to control the amount of food she was putting into her mouth by either blocking the food on the plate with her hand or remove it so that it was impossible for Ola to grab another piece from the plate. The adult was also responsible to intervene when Ola gagged or choked by putting her finger into Ola's mouth to hook out the food that caused the problem.

Overfilling her mouth was not only unsafe, but for Ola it also resulted in three major social issues. Firstly she was not allowed to eat without adult supervision. This limited her independence and was quite intrusive. Secondly, she communicated the question to her "teacher " and indicated that she did not like it when the She was assisting her to eat, while her peers could eat without help. This was reinforced during observations when she indicated that she didn't want an adult with her because her peers didn't have an adult with them. Thirdly, the gagging and choking were unpleasant for her peers to experience when they were also eating, and they would isolate Ola by avoiding sitting close by whenever she was eating. It was clear that this way of eating socially isolated Ola and that a change in her eating habits was essential if she was to be socially included.

Instrument & Material

1. The Teacher 's rating of child's eating behaviour scale , a measurement instrument was specifically developed for the study to measure the autistic child's eating behaviour . The scale consists of fourteen items . The teacher responses by indicating whether the child was (always - sometimes – rarely) doing this .

2. A Social Story was developed according to the guidelines determined by Carol Gray (1998) .

The Social Story consisted of three pages. The first page was a title page with a photo of a child , showing the number 'one' with his index finger to indicate that he is learning to take one bite at a time. The story included the safety aspect (*I am taking one bite at a time so I eat safely*), as well as a social aspect (*My friends like it when I take small bites*).

Visual prompts and schedules are recommended to overcome a number of deficits among students with ASD, such as auditory processing, language use and understanding, organisation, understanding sequencing and memory while it relies on strengths typical of children with ASD, such as visual processing and understanding. Visual clues also present the material in a concrete and logical way (Ganz, 2007).

The written script consisted of five sentences. The sentences and the relation in which they were used followed Gray's guidelines . The Social Story had an introduction which stated the topic: 'Why is it good for me to take one bite at a time?' It contained a directive sentence: 'I am learning to take one bite at a time'; a perspective sentence: 'My friends like it when I take small bites'; an affirmative sentence: 'It is good to chew one small bite at a time' and a cooperative sentence: 'When I eat I will try to take small bites and swallow so my mouth is empty before I take the next bite'.

Design and statistical analysis

For the purpose of this study, pre- post – follow up design was used to examine the effectiveness of the social stories Intervention Strategy on self management eating behaviour of the target child .

Target Behaviour

The targeted behaviour was set after consultation with the parents and the teacher , and was chosen for both safety and social reasons. The desired behaviour was that the child would finish one mouthful before reaching out for another. The hypothesis was that this target behaviour would result in a safe and socially acceptable way of eating.

Procedure

The first researcher read the Social Story to the child every day before lunchtime started. The intervention took place over a period of fourteen days. The second researcher read the Social Story to the children to determine whether the desired behaviour would generalise. To determine whether generalisation would take place in a different environment, in this case the home, a copy of the Social Story was send home for the parents to read to the child before mealtimes.

Results

The present study addresses the following question : Does the use of the social stories intervention strategy have a positive effect on self management of eating behavior of the target child ?

Table 1 shows the differences between pre- and post testing , and between post and follow –up testing .

Results of Participants' Pre- and Post-Intervention , post- intervention and follow- up for Target Behavior

Interventions	Pre – intervention	Post- intervention
Scores	16	46
Interventions	Post-intervention	Follow – up
Scores	46	45

Table 1 shows that there were statistically significant differences between pre- and post testing in eating behaviour of the target girl child in favor of the post testing , as the girl gains a high score on The Teacher 's rating of child's eating behaviour scale, compared to her score in pre testing . This is attributed to the use of social stories intervention strategy.

It also shows almost no difference between the girl's post and follow – up scores on The Teacher 's rating of child's eating behaviour scale, which indicates that the girl learnt the required target behaviour and maintained for a period of time (follow – up testing took place after 21 days from the post testing) .

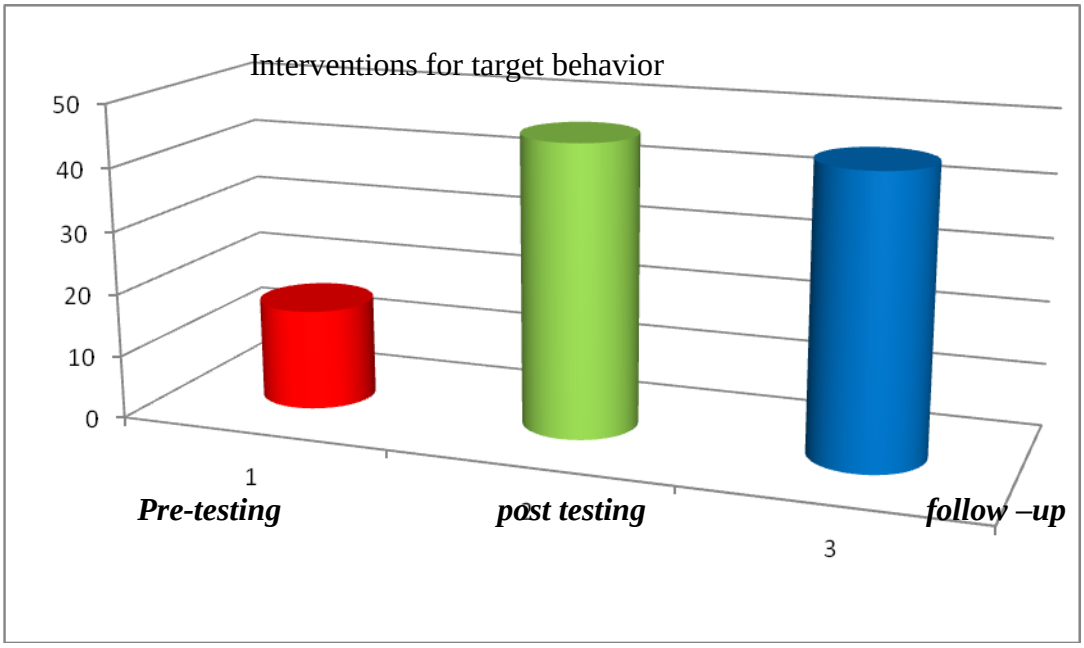

Figure 1. Results of Pre- post-, and follow up interventions for target behavior

Discussion

The purpose of my present study was to evaluate the effects of a Social Story to teach self management of eating behavior of a child with autism that would also prevent her from choking. Social stories are an increasingly popular tool for teaching social skills to children with autism by providing them with accurate social information. Previous research regarding the effectiveness of social stories technique Norris and Dattilo (1999), Romano (2002), Scattone et al., (2002), Bledsoe, Myles and Simpson (2003), Chalk (2003), Kuoch and Mirenda (2003), Adams et al. (2004) provide the rationalization for exploring the use of this technique for teaching self management of eating behavior of a child with autism.

Although it was supposed that her eating behaviour would improve gradually over time, the rapid and sudden change from the first day of the intervention was unexpected. The times when Ola reached out for another piece of food before finishing one mouthful decreased to between one and three percent.

This result goes in line with the study conducted by Bledsoe, et.al. (2003)which investigated the use of a Social Story as the sole intervention to improve the mealtime skills of an adolescent with Asperger syndrome, also showed significant changes within the first week after the intervention was put in place. Bledsoe, et.al. referred to the observations of Gray and Garand in 1993 and stated "...when Social Story interventions are effective the results are typically apparent within the first week" (p.293).

There are a number of possible reasons for the rapid change in Ola's behaviuor : The teacher suggested that the influence of her peers played an important role to bring about this change. When the photos for the Social Story were taken on day four before the intervention , the peers asked questions and were told that the photos were taken to develop a story for Ola to help her with her eating. They were alerted that some intervention was going to be put in place.

Another possible reason for the sudden change may be that when the Social Story was put up on the wall above Ola's desk, the peers showed a great interest in it and the teacher observed that they talked a lot about it; both to Ola and among themselves. These conversations were quite positive and they committed themselves to assure that the intervention was going "to work". The teacher expressed the view that the expectations that the peers had, that Ola's way of eating was

going to become more acceptable, played a very important role. It seems that this positive peer pressure to expect Ola to eat in a socially acceptable way was an additional motivation for Ola to comply.

A third possible reason for this sudden change was clearly the powerful message that the first photo in the Social Story carried: 'One bite at a time'. Whenever Ola saw me at school, she indicated 'one bite at a time' by showing 'one' with the index finger of her right hand. As the intervention developed, it seemed as if this simple gesture summarized the whole message to eat safely. After the intervention phase , this is still the gesture that she makes when going out for having food, or when she sees me at school.

Conclusion

In this present study, pre- post- follow up design was used to examine the effectiveness of the social stories Intervention Strategy on the eating behaviour of the target child . Data showed that the Social Story was successful in changing the eating behaviour.

Limitations

The girl was taught to eat appropriately using social stories strategy when there were no other children present . In order to learn to eat appropriately, she should have been taught to eat while she was among other children . This will help her to be more sociable . Another limitation was that the researchers were not sure whether the parent at home was implementing the intervention or not . It was useful to ask the parent through a self report scale , or an interview .

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