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Use of Social Stories™ as a Behavioral Intervention for Children with Autism

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USE OF SOCIAL STORIES™ AS A BEHAVIORAL INTERVENTION FOR
CHILDREN WITH AUTISM

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A Research Paper
Submitted in Partial Fulfillment of the Requirements for the
Master of Science in Education Degree

Department of Special Education and Psychology
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RESEARCH PAPER APPROVAL

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DEDICATION

This paper is dedicated first of all to God Almighty. Thank you to my husband for his staunch support of my effort to do this program, and to my children, Adedamola Alade, Adedolapo Adenike, and ‘my baby’, Adedotun Adedapo.

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CHAPTER 1

INTRODUCTION

Nearly 70 years after Leo Kanner (1943) first described a pattern of behavior as “early infantile autism” the news that autism is on the rise (Centers for Disease Control and Prevention, 2012; Waldron, 2000) is disturbing for parents and children affected by the disorder, considering the cost parents bear (California Department of Developmental Services, 2002, 2003) and the psychological and social impact on the affected child. The Individuals with Disabilities Education Act (IDEA) defines autism “as a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three that adversely affects a child's educational performance” (U.S. Department of Education, n.d., para. 6). Once considered a rare disorder with an estimated prevalence of approximately two to four in 10,000 children (Wing & Porter, 2002), autism has increased as much as twentyfold by some estimates within two-decades (Tidmarsh & Volkmar, 2003). Today, it is perhaps the most prevalent childhood disorder with nearly one in 88 children diagnosed with an ASD in the United States (Centers for Disease Control and Prevention, 2012).

It is currently estimated that as many as 1.5 million Americans are living with some form of autism (Reffert, 2008). It is reported to occur in all racial, ethnic, and socioeconomic groups, and is approximately 5 times more common among boys than girls (Centers for Diseases Control and Prevention, 2012). Of the total number, 100,000 are school-aged children who are served under the Individuals with Disabilities Education Improvement Act of 2004 (IDEIA 2004). Although it remains unclear whether this increase is due to improvements in clarity of the diagnostic criteria (Fombonne, 2003a), improved assessment measures of a broader definition of autism (Fombonne, 2003b), or the skills of pediatricians and diagnosticians (Special Education

Report, 2000), service providers are required to address the unique needs of this population (National Research Council, 2001).

Typically, autism affects a child's ability to communicate and interact with others (Autism Society of America, n.d.). It is a complex neuro-developmental disorder (Kim et al., 2002; Volkmar, Lord, Bailey, Schultz, & Klin, 2004), defined by a set of behaviors that affect individuals differently and to varying degrees. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences.

For children with autism, the gestures and expressions that are integral parts of human communication are confusing and have little relevant meaning (Gray, 1995). They are impaired in their ability to understand and interpret social cues accurately (Gray, 1995). For instance, in a social situation, the children may fail to predict others' actions. Therefore, in order "to keep things understandable, they invest energy and determination to ensure that routine and schedules are adhered to strictly" (Gray, 1995, p. 219). The complex nature of this disorder, coupled with lack of biologic markers for diagnosis and changes in clinical definitions over time, create challenges in monitoring the prevalence of ASDs but has led to the development of different interventions (Centers for Disease Control and Prevention, 2012; Gray, 1995; Green, Pituch, Itchon, Choi, O'Reilly, & Sigafos, 2006; Stahmer, Collings, & Palinkas, 2005; Marcus, Schopler, & Lord, 2000). Research has revealed that interventions that target specific areas of need, such as social skills, language acquisition, nonverbal communication, and behavior management can greatly improve the lives of children with an ASD (National Research Council, 2001). A large number of studies have focused on improving social areas in early childhood and

without such intervention, children with autism may lack the ability to develop close friendships and relationships in later years (Koegel, & Lazebnik, 2009, Kroger, Schultz, & Newsom, 2007).

A number of empirically supported interventions show promise in improving social functioning. Kroger, Schultz and Newsom (2007) compared the effects of direct teaching with play activities on social skills acquisition for twenty five 4 – 6 years old children with autism. Findings indicated that while members of both groups increased pro-social behaviors, the direct teaching group made more gains in social skills such as sitting, paying attention and answering questions in a group setting, like circle time. Also, Moore and Calvert (2000) compared the effects of a computer program with teacher-directed behavior training on vocabulary acquisition for children with autism. Children using the computer program significantly increased their learning vocabulary as well as their attention and motivation scores. This finding suggests that video modeling or the use of computer programs are effective teaching strategies for children with autism because those devices capitalize on the children's strength for visual learning and preferred leisure activity - a finding that is consistent with other studies (Charlop-Christy & Daneshvar, 2003; Charlop & Milstein, 1989; D'Ateno, Mangiapanello, & Taylor, 2003; Nikopoulos & Keenan, 2003; Sherer et al., 2001; Taylor, Levin, & Jasper, 1999). Moreover, video modeling has been shown to be more effective (that is, leads to faster acquisition rates of learned behaviors) than in-vivo (live) modeling (Charlop-Christy, Le, & Freeman, 2000).

Koegel, Vernon, and Koegel (2009) investigated the effects of embedding social interaction into a reinforcer in a naturalistic language intervention context of three children diagnosed with autism. The adult presented a potential reinforcer and attempted to entice the child to verbalize a request. For example the adult could put a cup to his/her mouth, and if the child said 'drink', he would be given a drink to reinforce verbalizing his request. Specifically,

this study examined whether embedding social interactions into reinforcers delivered during language intervention would lead to increased levels of child-initiated social behaviors. Findings from the study showed that the sessions with embedded social interactions resulted in increased levels of child initiated social engagement during communication, improved nonverbal dyadic orienting, and higher ratings of overall child affect compared to the non-embedded conditions. The effects did not generalize to non-training situation and there was no carryover of the response that was generated during the intervention after it ended. The children were paying attention to what the adults partnering them were doing, and were able to imitate the action of these adults. This was interpreted as initiating social interaction by following prompts given by the adults.

As we have different interventions for autism, early intervention programs and schools preparing to serve children with autism face difficulty in determining which interventions are most appropriate. Looking at the applications and efficacy of interventions is important because once children with autism enter the school system, their success may be compromised. One of the many interventions that have been developed for children with autism is Social Stories™ (Gray, 1995).

Social Stories™ are “an approach to improve a child’s understanding of social situations through visual instructional materials” (Gray, 1995, p. 219). The instructional technique is thought to minimize the confusion of verbal instructions and social interactions for individuals with autism (Gray & Garand, 1993) through the use of pictures or symbols combined with short sentences in a book format (Hagiwara & Myles, 1999).

Social Stories™ involve “the use of instructional materials and techniques from a child’s natural experience to visually present social information and teach social skills, and it focuses on

the skills a child needs in a variety of social context” (Gray, 1995, p. 220). In addition, it is individualized for each person and typically comprises two to five sentences. Sentence types include (a) *descriptive* -- information about the setting, subjects, and actions; (b) *directive* -- statements about the appropriate behavioral response; and (c) *prescriptive* - sentences describing the feelings and reactions of others in the targeted situation (Gray, 1994; Gray & Garand, 1993). It may take the form of printed words alone, words paired with pictures, words paired with pictures and audiotapes, or a videotape (Gray & Garand, 1993).

Gray (1995) characterized Social Stories™ in three parts of instructional activities namely *social stories*, *social review*, and *social assistance activities*. These steps can be taken individually or collectively to assess a child’s perception of a situation. Social Stories™ describe social situations and desired social skills (Gray & Garand, 1993). This is applicable to many settings and can be used to teach a variety of social skills. “For Social Stories™ to be effective, the ability to read, write, and comprehend is necessary, but is not required because modifications of some activities can be made” (Gray, 1995, p. 221). *Social Review* is an instructional process that uses videotaped sequences to informally assess a child’s perceptions of social situation, present accurate information, and assist and support a child in developing effective social skills. Social assistance activities are materials and activities that can be implemented to provide support for new social skills a child is learning skills identified in Social Stories™ or through the social review process. The three steps differ in use of instructional materials, but they target deficits in a child’s social skills through four basic steps: “targeting a social situation or social skills, gathering information, sharing observations, and supporting new social skills” (Gray, 1995, p. 220).

Social Stories™ function as a social model in depicting the target child or a character the child may identify with and then describe that character's behaviors, thoughts, and feelings as the child accomplishes the behavioral goals outlined in the story (Feinberg, 2002; Gray, 1995; Gray & Garand, 1993; Rogers & Myles, 2001). A benefit of using written text as a model for teaching social skills is that other people's perspectives, thoughts, and feelings can be included (Cartledge & Kiarie, 2001; Gray, 1995). When fully deconstructed, Social Stories™ is similar to social modeling (Bandura, 1971), task analysis (Englemann & Carnine, 1982), visual aids (Dettmer, Simpson, Myles, & Ganz, 2000), practice with corrective feedback (Bandura, 1971), and priming (Schreibman, Whalen, & Stahmer, 2000; Wilde, Koegel, & Koegel, 1992), and the use of Social Stories™ is becoming a popular trend to teach appropriate social skills and behaviors to children with autism (Krantz & McClannahan, 1998; Rowe, 1999; Schuler & Wolfberg, 2000).

Purpose of Review

Current literature on Social Stories™ describes its potential benefits but there is little empirical evidence demonstrating the effects of the strategy for children with autism (Elder, 2002; Yarnall, 2000). The purpose of this review was to examine current research on Social Stories™ that is to identify how the strategy has been used. More specifically, this review examined existing literature on Social Stories™ interventions to determine (1) who implemented them (2) duration of implementation (3) in what settings (4) the target population (5) the target behavior(s), and (6) the outcomes.

CHAPTER 2

LITERATURE REVIEW

Methods and Selection Procedure

The procedure defined by Cooper (1998) and White (1994) was used to identify the collection of studies included in this review. It included searches in subject indexes, citation searches, browsing, and footnote chasing with the descriptors: “autism”, “autism intervention”, “autistic youth”, “autistic disorder”, “social skills”, “social interactions”, “storytelling”, and “developmental disabilities” used to retrieve information. Other relevant materials found through Internet sites were acquired using *Google Scholar* search engine.

The selection of studies was conducted via a two-step approach that began as a broad search for locating potentially relevant research articles and subsequently applying a predetermined selective criterion. To be included, a study had to meet the following criteria: (a) it was a Social Stories™ study conducted on children with autism; (b) was published between 1995 and 2012.

Eleven studies were located meeting both the inclusion criteria. Once the articles were identified, the next step was to read and use a coding system based on two published syntheses (Klinger & Vaughn, 1999; Vaughn & Klinger, 1998) to arrange information from each intervention study using the following categories: research design/research methodologies, demographic characteristics of the participants and setting (e.g., the age of participants), target behaviors, and the outcomes.

Demographic Characteristics of Participant

A total twenty-two participants diagnosed with autism spectrum disorders were involved in the studies under review. The children displayed different characteristics including intellectual disability, disruptive behavior, Attention Deficit Hyperactive Disorder (ADHD), limited expressive language skills beyond echolalia. All the children displayed a social skills deficit, (social interaction with peers, proper meal time behavior, talking out) which is a defining feature of autism. The age range was five to fifteen years. Twenty of the participants were male (90.9%). None of the children demonstrated physical disabilities; however, at least three of the children were receiving some medication to assist in behavior control and to reduce obsessive-compulsive behavior (Bledsoe, Myles, & Simpson, 2003; Lorimer, Simpson, Myles, & Ganz, 2002; Kuttler, Myles, & Carlson, 1998).

Target Behaviors

A majority of the studies aimed at reducing isolated destructive or inappropriate behaviors including talking out (Crozier & Tincani, 2005), washing hands (Hagiwara & Myles, 1999), inappropriate social interactions with peers during unstructured free-time activities (Barry & Burlew, 2004; Scattone, et al., 2006), repetitive tapping of hands (Reynhout & Carter, 2007) and exhibition of stereotypical behaviors (e.g., playing with rolled paper) (Scattone, et al., 2006); food and drink spilling (Bledsoe, Myles, & Simpson, 2003); or screaming, cursing, and dropping to the floor (precursor to tantrum) (Kuttler, Myles, & Carlson, 1998; Scattone, et al. 2002), and throwing of toys (Lorimer, et al., 2002). Also, some of the investigations targeted skill acquisition and an increase in appropriate social interactions (Swaggart, et al., 1995). One of the studies (i.e., Scattone, Tingstrom, & Wilczynski, 2006) focused on building and increasing appropriate social behaviors and correcting some of the limitations of a previous study (Norris & Dattilo, 1999) that attempted to promote appropriate social interactions. This was accomplished

by administering only one social story to each of the three participants diagnosed with ASD. In Hagiwara and Myles (1999), the goal was to present social stories using a multimedia board to teach children new skills.

Research Designs used in the Studies

All but one of the studies used single subject reversal designs (i.e. ABAB, ABAC) or changing conditions designs (ABC) and multiple baseline designs across participants to evaluate the effectiveness of Social Stories™ in reducing disruptive behaviors or in teaching social skills. Single subject “experimental designs provide greater certainty that a planned intervention is responsible for a change observable in time-series data than is provided by the AB quasi experiment” (Weiner & Edward, 2010, p. 1602). The designs allow for a focus on the individual in which the individual is used as his or her own control observation. The advantage in reversal design is that there is repeated demonstration of the effects of changing conditions implemented by the researcher (Weiner & Edward, 2010). Tawney and Gast, (1984) suggest that a “multiple baseline design across conditions can prove helpful in identifying intervention programs that foster generalized responding across many natural environments” (p. 247). This design also controls for internal validity threats by having participants provide several baseline tests before intervention begins. It is considered equally suitable because teachers are able to respond to the social behavior of children across a broad range of environmental conditions beyond the classroom including lunch rooms, and play ground and can concurrently modify the environmental excesses (Kazdin, 1982; Tawney & Gast, 1984). The design requires implementation of intervention in a staggered fashion across three different series so that each participant serves as a control for the other participants versus serving as own control.

Barry and Burlew (2004) paired social stories with teacher's verbal prompt to assess the effects of the strategy on each student's ability to independently make choices and play appropriately with materials chosen, and with peers during free-play time in the classroom. Swaggert et al. (1995) study involved combining social stories with a behavioral social skills training model and, for one participant, a response-cost system using an AB single subject design. Reinforcers were incorporated into the social skills training strategy to encourage the desired responses. Child-specific social stories that included drawings and photographs were created for three children with autism. The participants included an 11-year-old girl who greeted strangers inappropriately and two 7-year-old boys whose inappropriate behaviors consisted of aggression, inappropriate play, and grabbing toys. Results of the study demonstrated that the behavior of all three children improved subsequent to intervention implementation. Given the limitations of an AB design and the fact that the social stories were combined with other interventions, the source of improvement could not be isolated to social stories. Furthermore, the use of social stories with a behavioral social-skills training program makes it impossible to determine which intervention produced the desired behavior change (Crozier & Tincani, 2005)

Kuttler, Myles and Carlson (1998) used social stories across two different settings in an effort to reduce the tantrum behaviors of a 12-year-old boy with autism. Target behaviors included screaming, cursing, and dropping to the floor. Two separate social stories were created (i.e., one for lunch-time and one for work-time). In addition to social stories, other interventions (i.e., verbal prompts and a token economy) were in place. An ABAB design was employed with each social story beginning simultaneously. Although a reduction in pre-tantrum behaviors was noted, the social stories were again combined with other interventions, making it difficult to

determine if the social stories alone were effective or if the combination of the social story with the verbal prompts and the token economy produced the behavior change.

Crozier and Tincani (2005) used a reversal design to examine the effect of a modified social story with and without verbal prompts on the targeted disruptive behavior of an eight-year-old boy with autism. The target behavior was talking out. Reading skills were assessed using the Analytical Reading Inventory (ARI; Woods & Moe, 2003). The ARI is an informal reading inventory designed for use in classroom and clinical settings to provide information on how a reader processes text (Woods & Moe, 2003). The goal was to determine whether a modified social story would be effective in reducing challenging behaviors. Gray (1994) suggests that deviations from the guidelines may be appropriate in some instances. Although the story contained descriptive, perspective, and directive sentences, as well as illustrations that reflected participant's interests, it deviated from Gray's (2000) guidelines. First, the ratio of directive to perspective and descriptive sentences recommended by Gray is 1:2–5. The modified story written for the participant by Crozier and Tincani (2005) had a ratio of 3:5. Second, the story did not include such words as sometimes or usually-words typically used to protect against the literal expectations of students with autism. Crozier and Tincani (2005) justified the reason for writing a story that deviated from Gray's guidelines on the grounds that it was meant to accommodate the boy's academic level. "The intention was to write a story that the participant would eventually be able to use independently, thereby reducing the amount of teacher–student instruction" (p. 153). To achieve this goal, the story was shorter than many of the example stories in the literature. Specifically, the story vocabulary included known words as much as possible, key words were repeated throughout the story, the print appeared at the same place on each page and was clearly separated from the pictures, and words were clearly separated for easy

pointing. The study used ABAC reversal design, and as the observation to assess the rates of the target behavior, observation was conducted in a regular class setting. Two interventions were used: a modified Social Stories™ without verbal prompts (Phase B) and a modified Social Stories™ with verbal prompts (Phase C). As the frequency of problem behavior during baseline and intervention was compared to determine effect, it appeared the rates of behavior were most stable during the final intervention phase, with 5 days of consistent data. During the two maintenance observation sessions, participant's talk-out behavior remained at zero.

Using a multiple baseline design across settings, Hagiwara and Myles (1999) expanded the investigation further by adopting multimedia technology to present social stories. "The multimedia social story intervention embodies the characteristic of social stories in a structured, consistent, and attractive presentation with ample social stories and sound made possible by the computer system" (p. 83). Specifically this study focused on the effect of the intervention for improving social or behavioral problems identified with three boys with autism and their abilities to generalize the behavior to other changes to environments in which the intervention was not conducted

Settings

A structured and concrete educational environment is considered essential for persons with autism (Mesibov, Schopfer, & Hearsey, 1994) because they often have difficulties in assembling fragmented information into a whole and in decoding abstract information (Frith, 1989). All but one of the studies was conducted in well-staffed and highly structured settings (e.g. a special education classroom, play area of a resource classroom, or a self-contained laboratory classroom for children with autism within the special education department of a university). The only exception was a five-year old boy who attended an early childhood special

education program four days a week and received speech and language occupational and behavioral therapy in his home. His parents specifically set aside a playroom/basement as an area for therapy, and one of the parents was always available during the therapy session (Lorimer & Simpson, Myles, & Ganz, 2002).

Implementation of Social Stories™ varied across the studies. For instance, in cases where intervention took place during a structured classroom session, the classroom teacher and assistant collected data and implemented the intervention while in other cases, researcher assisted by graduate assistants or undergraduate students who were trained for the intervention program collected observation data and implemented the interventions. In the case of Lorimer et al., (2002), two therapists assisted by either of the parents of the 5-year old boy (treated for precursor to tantrum) implemented the sessions. Parent implemented autism treatment is a recommended key component to effective treatment intervention for children with autism (National Research Council, 2001). Studies have established that parent-implemented interventions lead to better generalization and maintenance of skills than therapist-implemented interventions, may lead to core child gains overall (Drew et al., 2002), improve the quality of life for the family by decreasing parental stress (Koegel, Bimbela, & Schreibman, 1996; Shields, 2001)) and increasing leisure/recreation time (Koegel et al., 1982), and increase optimism about their ability to influence their child's development (Koegel, Schreibman, Britten, Burke, & O'Neill, 1982), which may help them sustain their efforts with their child over time.

Duration of the interventions

The duration of interventions varied across the studies, from minimum 19 to 70 days. A few studies tabulated on the basis of the number of sessions completed with participants while others calculated based on the number of days. In all the cases, none was less than three weeks.

Outcomes

There was some evidence suggesting that Social Stories™ is an efficacious intervention for promoting appropriate social interaction and reducing disruptive behavior among children with autism. The studies reviewed demonstrated that Social Stories™ may be used as a sole intervention to increase appropriate social interactions for some children on the autism spectrum (Barry & Burlew, 2004; Norris & Dattilo, 1999; Scattone, et al., 2006; Swaggart et al., 1995; Thiemann & Goldstein, 2001). For example, Barry and Burlew (2004) participants demonstrated gains in their ability to make independent choices and play appropriately during free-play time in the classroom (Kuttler et al. 1998); Lorimer, et al., 2002; Scattone, et al., 2006).

The studies also reported that participants demonstrated significant reduction in disruptive behaviors (e.g., Bledsoe et al., 2003; Lorimer et al., 2002; Scattone et al., 2002). Scattone et al., (2002) reported reductions of disruptive behavior occurred in three participants. The greatest was from a mean of 50% of intervals during baseline to a mean of 4.6% of intervals during intervention. Lorimer et al. (2002) also reported effectiveness of the intervention method for reducing precursor to tantrum, especially for a home setting program implemented collaboratively by parents and professionals. Bledsoe et al. (2003) demonstrated the effectiveness of the intervention method in reducing the target behavior of a young man with Asperger syndrome but acknowledged the participant's motivation to reduce the inappropriate behavior.

Kuttler et al. (1998) used an ABAB design, thereby addressing some of the methodological difficulties of the Swaggart et al. (1995) study. Results indicated a significant reduction in problem behavior during the intervention and because the participant's functioning level was lower than initially recommended by Gray and Garand (1993), the success of the

intervention suggests that social stories may be useful even for children with lower cognitive skills.

Crozier and Tincani's (2005) study examined the effects of a modified Social Stories™ intervention. Findings demonstrated the intervention to be effective at lowering disruptive behavior when paired with an additional variable-verbal prompt that is delivered on a variable interval schedule. The results agree with Kuttler et al.'s (1998) findings that Social Stories™ result in reductions in challenging behaviors. The results also suggest that verbal prompts served as effective reminders for the participant to follow classroom rules and to refrain from disruptive responses. It is, therefore, recommended that when Social Stories™ are used in typical classrooms, teachers provide regular prompts for students to engage in appropriate behaviors, at least initially.

Although many studies suggest that Social Stories™ are an effective intervention for children with autism, Hagiwara and Myles (1999) found no consistent results in their multiple-baseline across settings study. Although the intervention increased the skill levels of some of the participants in certain settings, only one of the three participants (a seven years and 11 months old boy) demonstrated generalization of skills across settings. Moreover some of the participants showed generalization of newly acquired information across settings; however, it is not possible to determine whether the lack of effect in this study was due to the use of social stories, the multimedia approach, or other confounding variables. Possible explanations for the variability of the results include (a) duration of the intervention, (b) individual differences among participants, (c) nature of the target behavior, (d) consistency in educational environment, and (e) enthusiasm for watching the multimedia social story program. However, students with autism often do not

generalize skills (Arora & Goodnough-Trepagnier, 1989; Battenberg & Merbler, 1989; Chen & Bernard-Opitz, 1993; Kennedy & Haring, 1993; Kuttler et al., 1998; Swaggart et al., 1995).

CHAPTER 3

DISCUSSIONS, IMPLICATIONS, AND ONCLUSION

Discussions

This review reflects outcomes from selected studies on the use of Social Stories™ as an intervention procedure to promote appropriate social interaction and reducing disruptive behavior among children with autism. Specifically the study examined existing literature on Social Stories™ interventions to determine (1) who implemented them (2) duration of implementation (3) in what settings (4) the target population (5) the target behavior(s), and (6) the outcomes.

The studies have revealed that Social Stories™ may be used as a sole intervention to increase appropriate social interactions for some children on the autism spectrum (Barry & Burlew, 2004; Norris & Dattilo, 1999; Scattone, et al., 2006; Swaggart et al., 1995; Thiemann & Goldstein, 2001). For example, Barry and Burlew (2004) participants demonstrated gains in their ability to make independent choices and play appropriately during free-play time in the classroom (Kuttler et al. 1998); Lorimer, et al., 2002; Scattone, et al., 2006). The studies also reported that participants demonstrated significant reduction in disruptive behaviors (e.g., Bledsoe et al., 2003; Lorimer et al., 2002; Scattone et al., 2002). Scattone et al., (2002) reported reductions of disruptive behavior occurred in three participants. The greatest was from a mean of 50% of intervals during baseline to a mean of 4.6% of intervals during intervention. Lorimer et al. (2002) also reported effectiveness of the intervention method for reducing precursor to tantrum, especially for a home setting program implemented collaboratively by parents and professionals. Bledsoe et al. (2003) demonstrated the effectiveness of the intervention method in

reducing the target behavior of a young man with Asperger syndrome but acknowledged the participant's motivation to reduce the inappropriate behavior.

Implications for Practice

The literature on social stories suggests that effective use of this intervention by classroom teachers could promote appropriate social interactions, independent choice-making and appropriate play skills, and lead to a reduction in disruptive behavior among children with autism. The literature also provides suggestions of how classroom teachers can effectively use Social Stories™ for children with autism. For example, pairing Social Stories™ with an additional variable (e.g., verbal prompts that are delivered on a variable interval schedule) (as in Crozier & Tincani, 2005) can promote reduction of disruptive behavior. In this case verbal prompts can serve as effective reminders for the participant to follow classroom rules and to refrain from disruptive responses. It is therefore, recommended that when Social Stories™ are used in typical classrooms, teachers provide regular prompts for students to engage in appropriate behaviors, at least at the initial stage.

Implications for Research

It is unclear from the reviewed research which child or youth on the spectrum will most likely respond to this instructional method. In addition, some of the studies used a combination of Social Stories™ and other strategies such as verbal prompts and token economy (e.g., Kuttler, Myles & Carlson, 1998) which makes it difficult to determine if the Social Stories™ alone were effective or if it was the combination. Although the use of Social Stories™ was successful in well-staffed and highly structured settings, it becomes difficult if not impossible to predict whether the strategy would be useful under different settings such as the home and community centers. Similarly the length of time that the strategy may maintain its effectiveness on the

children is unknown. None of the studies looked at maintenance of the results after the intervention had ended. Intervention studies that have large sample sizes (Anderson et al., 1987; Lovaas, 1987; Rogers & DiLalla, 1991; Rogers & Lewis, 1989; Sheinkopf & Siegel, 1998; Weiss, 1999) share three similar characteristics: (a) the interventions focused on a variety of areas including language, behavior management, social skills, etc.; (b) the interventions were intensive and lasted for a long time; and (c) the interventions involved the children's parents. These findings have implications for professionals in developing and implementing early intervention programs for children with autism. Children with autism appear to be more likely to benefit from interventions that are initiated at an early age, that are intensive and long lasting (at least 1 year), that target various developmental areas, and that include parents, who can facilitate the generalization process of learned skills. Developers of future autism programs should therefore, include these factors in their interventions. Further research involving more children and across settings is necessary to validate the effectiveness of Social Stories™.

Future studies on Social Stories™ should have large sample sizes in order to generate a reasonable degree of statistical power, include a long-term follow-up assessment schedule of at least a year. Future studies should also make use of widely recognized standardized tools to assess outcome in terms of children's social and communication skills, and secondary behavior problems, so as to enable others to assess the level of significance.

Conclusion

Research on Social Stories™ as an intervention strategy for children with autism appears to produce mixed results. The studies reviewed incorporated three components that are considered effective in the treatment of children with autism. These are Social Stories™, visual symbols, and computer-based instructions. They seem to have positive effect and applicability

for children and youth with autism. The positive outcomes of the studies are especially important because Social Stories™ are convenient, unobtrusive, and may draw on a strength many children with autism demonstrate (i.e., adherence to rules/routines) (Scattone et al., 2002). Since students with autism tend to be strong visual learners, Social Stories™ provide instruction in a medium of strength without the complexity of interpersonal interaction (Scattone, et al., 2002). Studies investigating the effectiveness of Social Stories™ have mostly used single subject designs. Results across these studies generally indicated a significant reduction in problem behaviors during the intervention. However, one study found no consistent results in their multiple-baseline experiment (i.e. Hagiwara & Myles, 1999).

There are compelling reasons to examine outcomes produced by various types of behavioral intervention for children with autism, least of which is the reported growing incidence of diagnoses (California Department of Developmental Services, 2002, 2003). The hope for early intervention for young children with autism as Ramey and Ramey (1998) noted is “for early intervention (is) . . . that children could be placed on a normative developmental trajectory and thus continue to show optimal development after early intervention ends” (p. 113).

Beyond the content of social stories, the method of teaching is also important. Social stories are taught using repetition, priming, and corrective feedback. The stories should be presented to the student on a regular basis and, using priming, should be reviewed with the child prior to entering a situation in which he or she can practice the skills (Wilde et al., 1992). Prompting the student to review the social story when an inappropriate behavior occurs or when an appropriate behavior is absent provides corrective feedback (Lorimer, Simpson, Myles, & Ganz, 2002).

Duration/intensity of intervention, age, IQ, language level and autism severity have been reported as predictive variables in some studies (Eikeseth et al., 2002; Gabriels, Hill, Pierce, & Rogers, 2001; Harris & Handleman, 2000; Ozonoff & Cathcart, 1998; Smith, Eike Klevstrand, & Lovaas, 1997), but others have failed to identify any specific factors relating to outcome (Birnbauer & Leach, 1993; Smith, Groen, & Wynn, 2000b).

It is evident from this review that the research on the use of Social Stories™ for children with autism is mostly based on single subject research designs. These studies contribute empirical evidence to the benefits of using Social Stories™ in the classroom setting. Gray and Garand (1993) observed that when Social Stories™ interventions are effective, the results are typically observable within the first week. However, the results are promising and previous studies have suggested Social Stories™ may be effective under some conditions, although there are some unexplored variables that may limit the effectiveness of the strategy for some children or for some behaviors. The limitations of the studies suggest additional research is necessary before the effectiveness of Social Stories™ can be better established and the conditions under which they are effective are fully understood.

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