

The Use of Social Stories to Reduce Precursors to Tantrum Behavior in a Student with Autism

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This study analyzed the effects of social stories in reducing precursors to tantrum behavior in two social environments, morning work time and lunchtime. The student was a 12-year-old boy diagnosed with autism, Fragile X syndrome, and intermittent explosive disorder. Using an ABAB design, two social stories were implemented and withdrawn as data were collected to determine the frequency of two behaviors, inappropriate vocalizations and dropping to the floor, which served as precursors to tantrum behavior. The data revealed a decrease in precursors to tantrum behavior when the social stories were available to the student and an increase in targeted behavior when the intervention was *withdrawn*.

Individuals with autism and autistic-like characteristics are generally characterized as having difficulty responding appropriately to the world around them. Thus, it is a commonly held belief that deficits in social interactions represent an underlying problem for this population (Baron-Cohen, 1988; Gray & Garand, 1993; Hodgdon, 1996; Kanner, 1943; Rapin, 1991). Wing (1988) described three categories of social interaction impairments: (a) impaired social recognition (apparent as a lack of interest in others), (b) impaired social communication (absence of body language and communication limited to expressing wants and needs), and (c) impaired social imagination and understanding (inability to engage in pretend play or to imagine another's thoughts and feelings). These impairments tend to isolate people with autism from the rest of society.

Historically, the literature surrounding autism and social behavior has focused heavily on these individuals' inability to communicate expressively (Kanner, 1943). For example, Kanner described individuals with autism as being isolated from their environment because of abnormal language or a total lack of language. Other studies have investigated echolalia and its expressive function in autism, finally concluding that echolalia serves as a form of communicative intent (Fay, 1969; Prizant, & Duchan, 1981; Prizant & Rydell, 1984; Prizant & Weatherby, 1987; Shapiro, 1977; Wing, 1971).

Literature has begun to explore deficits in receptive communication as well, finding that the inability of people with autism to process environmental information appropriately may account for many of their maladaptive social behaviors (Hodgdon, 1996; Koegel, Koegel,

Hurley, & Frea, 1992; Quill, 1995). It has been suggested, therefore, that an alternative to relying solely on verbal messages and environmental cues from others would help individuals with autism relate more appropriately to their environment (Gray & Garand, 1993).

A computer search was conducted to determine effective methods of instruction for students with special needs who experience difficulty with traditional verbal teaching strategies. Specifically, the ERIC and PsycLit data bases from 1980 to 1997 were searched using the following descriptors: special education, mental retardation, autism, visual schedules, pictures, graphic organizers, symbols, social stories, and visual communication. This search revealed numerous studies validating the use of alternative instructional methods including pictures, photographs, and line drawings for individuals with autism and other developmental disabilities. Each of these studies confirmed that people with autism generally have a visual learning style and are often not successful when this type of input is absent from instruction. Indeed, as shown in Table 1, most study participants were able to acquire pertinent skills when instruction was provided visually.

Gray and Garand (1993) introduced the social story method to the field of special education in 1993. Social stories,

TABLE 1
Overview of Studies to Enhance Receptive Communication

Author(s)	Year	N	Gender	Age	Diagnosis	Target behavior	Intervention	Results
Cooking/Food Tasks								
Gines, Schweitzer, Queen-Autrey, & Carthon	1990	10	7M/3F	21–40	EMR	Planning well-balanced meals	Color food photos mounted on 10 × 12-cm cards	+
Johnson & Cuvo	1981	4	3M/1F	21–51	EMR	Coded by food groups; cooking meals using broiling, baking, and boiling techniques	Recipes for six different foods on 22 × 28-cm paper with written instructions on the left and pictures on the right	+
Martin, Rusch, James, Decker, & Trtol	1982	3	1M/2F	23–40	EMR/TMR	Maintaining self-control while cooking complex meals	Photographs of step-by-step cooking instructions on metal rings	+
Vaughn & Horner	1995	1	M	21	Autism	Acceptance of chosen foods	Photographs of breakfast, snack, and lunch foods	+
Daily Living Skills/Self-Care								
Thinesen & Bryan	1981	3	M	28–42	EMR/TMR	Self-initiation and maintenance of morning grooming behavior	Photographs in an album depicting appropriate behavior and subsequent reinforcement	+
Nietupski, Welch, & Wacker	1983	4	M	19–21	TMR/SMH	Independent grocery store purchases	Copies of bill denominations laminated on 8 × 11-in. tagboard	+
Nietupski, Christiansen, & Clancy	1984	4	3M/1F	7–10	TMR/SMH	Independent vending machine purchases	Laminated cards showing correct change for three different machines	+
Krantz, MacDuff, & McClannahan	1993	3	M	7–8	Autism	Increased engagement and decreased disruption during home living tasks	Photographic schedule in three-ring binder	+
Pierce & Schreibman	1994	3	M	6–8	TMR/SMH	Maintaining on-task behavior throughout household chores	Color prints of task analysis steps in photo book	+
Homework/Leisure								
Frank, Wacker, Berg, & McMahon	1985	5	1M/4F	11–13	EMR	Independent use of two computer programs	Drawings of step-by-step computer instructions	+
MacDuff, Krantz, & McClannahan	1993	4	M	9–14	Autism	Decreasing off-task behavior during homework and leisure time	Photographic activity schedules in three-ring binders	+
Social Behavior								
Swaggart et al.	1995	3	2M/1F	7–11	Autism/PDD	Appropriate social behavior with strangers and peers	Social stories in book format on 6 × 8.5-in. pages depicting appropriate behavior	+
Vocational Skills								
Martin, Elias-Burger, & Mithaug	1987	5	5F	16–19	EMR/TMR	Independent movement from one workstation to another on time	Typed schedule indicating name of station and time to begin (pictures if needed)	+
Martin, Mithaug, & Frazier	1992	5	3M/2F	15–20	TMR	Independent furniture assembly	Two-page 8.5 × 11-in. manual consisting of line drawings depicting each step of assembly	+
Sowers, Rusch, Connis, & Cummings	1980	3	M	Adult	TMR	Time management on the job	Clock faces on 20 × 13-cm cards depicting break times	+
Sowers, Verdi, Bourbeau, & Sheehan	1985	4	M	18–21	TMR/SMH	Independent vocational task changes	Photographs of vocational tasks in assigned order	+

(table continues)

(TABLE 1 continued)

Author(s)	Year	N	Gender	Age	Diagnosis	Target behavior	Intervention	Results
Wacker & Berg	1983	5	2M/3F	18–19	TMR/SMH	Acquisition of vocational tasks	13 × 18-cm pictures of parts and how to attach them	+
Wacker & Berg	1984	3	1M/2F	19	TMR/SMH	Vocational sequencing tasks	Photographs of correct sequence in book form	+
Wacker, Berg, Berrie, & Swatta	1985	3	2M/1F	13–19	SMH	Independence in vocational and daily living tasks	Photographs of necessary steps in book form	+
Wilson, Schepis, & Mason-Main	1987	1	M	36	SMH	Independence in food service tasks	2 × 4-in. photos of participant performing each step of task	+

Note. SMH = severely multiply handicapped; TMR = trainably mentally retarded; EMR = educably mentally retarded. + denotes successful intervention.

compatible with a visual learning style, are used to teach children with autism desired social skills by using stories to cue appropriate responses to the environment (Gray, 1994; Gray & Garand, 1993).

Although the literature provides a strong basis for the use of pictures, photographs, and line drawings with individuals who have some form of communication deficit, limited research is available to directly support the use of social stories. This study validated the positive effect of a social story program on decreasing precursors to tantrum behavior in a student with autism.

Method

Participant and Setting

Participant. The student, Jon, who participated in this study was a 12-year-old boy who attended a residential school for children with special needs. Jon was diagnosed with autism, Fragile X syndrome, and intermittent explosive disorder. Jon received 100 mg/day of Amitriptyline to aid in behavior control. Jon's scores ranged from 2 to 5 years on the communication section of the Brigance Inventory of Early Development (Brigance, 1978), with a relative strength in receptive communication and a relative weakness in expressive form. On the Callier–Azusa Scale (Stillman, 1978), he obtained the following scores: cognition/60 months, recep-

tive language/48 months, expressive language/24 months, and actual speech/18 months.

Jon's speech consisted mostly of one- and two-word utterances that were often very difficult to understand. His vocalizations were enhanced by a communication book that contained 100 icons as well as manual signs and gestures. Jon also relied heavily on a picture schedule to complete activities throughout his school day.

Setting. Jon participated in a self-contained classroom for students with autism and other pervasive developmental disorders. Seven other students with extreme communication needs were enrolled in the class. The classroom environment was highly structured, with one certified teacher and three paraprofessionals. Both individual and group instruction occurred in the classroom, as well as in community settings. Jon also received (a) speech-language therapy, (b) occupational therapy, (c) adaptive music therapy, (d) adaptive physical education, (e) adaptive art therapy, and (f) horticulture therapy.

Targeted Behaviors

Even with a highly structured and routine classroom environment, Jon had a difficult time with social situations. For example, he exhibited tantrum-like behavior during unexpected transitions, wait time, and free time. Often, these be-

haviors resulted in him being placed in a time-out room. When this occurred, Jon lost instructional time in the classroom, which affected his progress, his self-concept, and his attitude toward school.

Many interventions had been initiated with Jon to explain what behaviors were appropriate and expected. These interventions included (a) classroom picture schedules, (b) individual picture schedules, (c) reinforcement at designated intervals, (d) sticker charts, (e) point charts, and (f) token systems. None of these interventions offered Jon the necessary skills to complete transitions, wait-time, and free-time activities effectively.

Because of his increasing age and size, Jon was becoming more difficult to manage physically and posed a threat of harming himself, his peers, or the classroom staff. Jon exhibited several behaviors that usually preceded a tantrum. The most prevalent behaviors were using inappropriate vocalizations and dropping to the floor. If staff were not able to successfully intervene in time, these signals usually indicated an escalation into tantrum behavior.

It was believed that if the behaviors that preceded a tantrum could be reduced before escalating to tantrum behaviors, Jon would have increased instructional time, better self-concept, and a much safer instructional environment. For this study, precursors to tantrum behavior were defined as an inappropriate vocalization (screaming or cussing) and dropping to the floor.

Intervention: Social Stories

Social stories are written by professionals, parents, and caregivers to describe social situations, relevant cues, and desired responses to a given situation. Gray (1994) and Gray and Garand (1993) recommended that the social story follow certain guidelines to provide the student with direct access to social information. Moreover, social stories should be individualized for the student and be adapted to fit the student's functioning level and learning style.

Social stories are usually composed of two to five short sentences with appropriate vocabulary and print size for the students' developmental level. Three basic types of sentences are used in a social story: (a) *descriptive sentences* that provide information about the setting, the people, and what they are doing; (b) *directive sentences* that tell the students what they need to do in a given situation to be successful; and (c) *perspective sentences* that describe the feelings and reactions of others (Gray, 1994; Gray & Garand, 1993). Social stories may take the form of printed words alone, words paired with pictures, words paired with pictures and audiotape, or a videotape of the social interaction (Gray & Garand, 1993).

Two different social stories were introduced for the two most difficult settings throughout Jon's school day. During morning work and lunchtime, Jon needed constant prompting to (a) wait, (b) transition from one environment to the next, (c) know when he earned a sticker, and (d) remember that he could earn a reinforcer for appropriate behavior. Figure 1 represents the social story designed for morning work. Figure 2 represents the social story designed for lunch.

Each sentence, along with its corresponding icon, was placed on white tagboard measuring 6 by 6 inches. The tagboard strip was laminated and bound by two metal rings on the left-hand side in book form. The cover consisted of construction paper folded over with the words "work time" and "lunch time" on the respective stories. The print type was

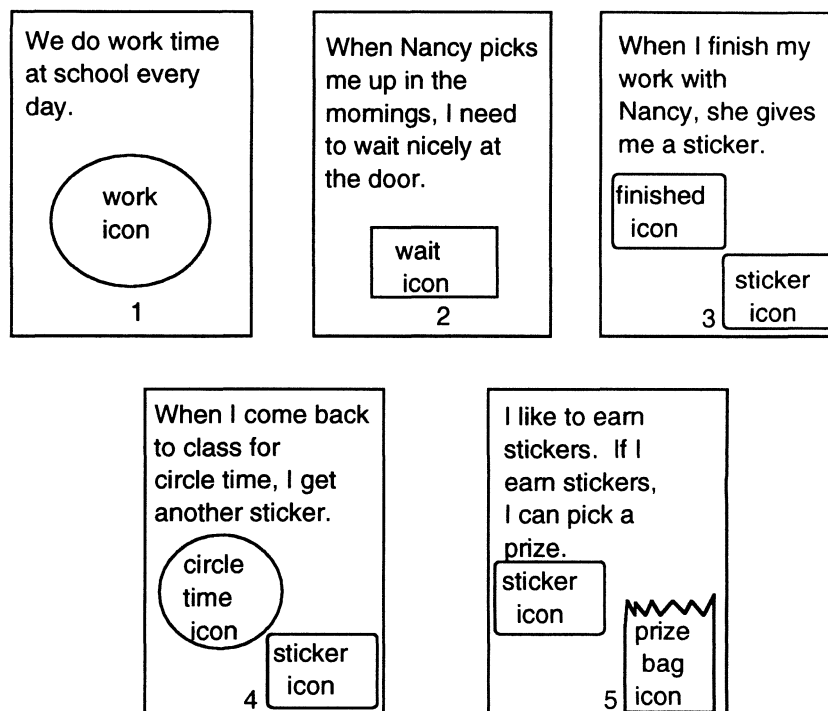


FIGURE 1. Work social story.

16-point Arial. The icons were taken from *The Picture Communication Symbols Book* (Mayer-Johnson, 1981), a text with which the student was already familiar.

Measurement

Throughout intervention, an event-recording system was used to tally the frequency of precursors to tantrum behavior (inappropriate vocalizations and dropping to the floor). Data were collected by the first author, who was also the classroom teacher, and the three classroom paraprofessionals.

Procedure

Experimental Design

An ABAB design was used to evaluate the effectiveness of the two social stories on decreasing the precursors to tantrum behavior. The first and third phases were baseline conditions. During baseline, the traditional classroom interventions were

provided: the classroom picture schedule, the student's sticker/point chart, and verbal and physical prompting from the staff. During the second and fourth phases, also referred to as the intervention phases, the social stories were read to the student immediately prior to work time and lunchtime by classroom staff. After the stories were introduced, the student had access to them whenever he wanted. The respective stories accompanied the student to the activity and as soon as one of the targeted behaviors occurred, the student was asked to refer to the social story to review appropriate behaviors.

Interobserver Reliability

Reliability checks occurred during 34% of the observations. Reliability was calculated by dividing the number of agreements by agreements plus disagreements and multiplying by 100%. An agreement occurred when all observers independently recorded the same number of vocalizations and drops to the

floor during a data collection interval. Interobserver reliability was 93%.

Results

Figures 3 and 4 present the results of the study. As shown during baseline, the mean frequency of precursors to tantrum behavior during morning work time was 15.6 (range = 10–19). During lunchtime, the mean frequency was 11.6 (range = 4–20). In Phase 2, when the social stories were introduced, precursors to tantrum behavior decreased to a mean of 0 during morning work time (range = 0) and 2.0 during lunchtime (range = 0–5). A return to baseline by withdrawing the social story intervention resulted in an increase of precursors to tantrum behavior. The mean occurrences rose to 15.33 during morning work time (range = 8–21) and 18 during lunchtime (range = 14–20). The final phase of this study, in which the intervention was reintroduced, revealed decreased precursors to tantrum behavior. Specifically, the mean during morning work time was 0 (range = 0), and the mean during lunchtime was 1.0 (range = 0–3).

Discussion

This study evaluates the effectiveness of two social stories on decreasing precursors to tantrum behavior in a student with autism. Interpretations and generalizations of the previous results must take into consideration the following factors: (a) single-participant involvement, (b) the participant's functioning level, (c) time span of the intervention, and (d) generalization/maintenance.

Limitations

Single-Participant Involvement.

Only one student participated in this study across two different settings. The student was chosen because of the problematic behaviors he exhibited. Similarly, the settings were chosen to represent the two most difficult times during the participant's school day. It is unknown

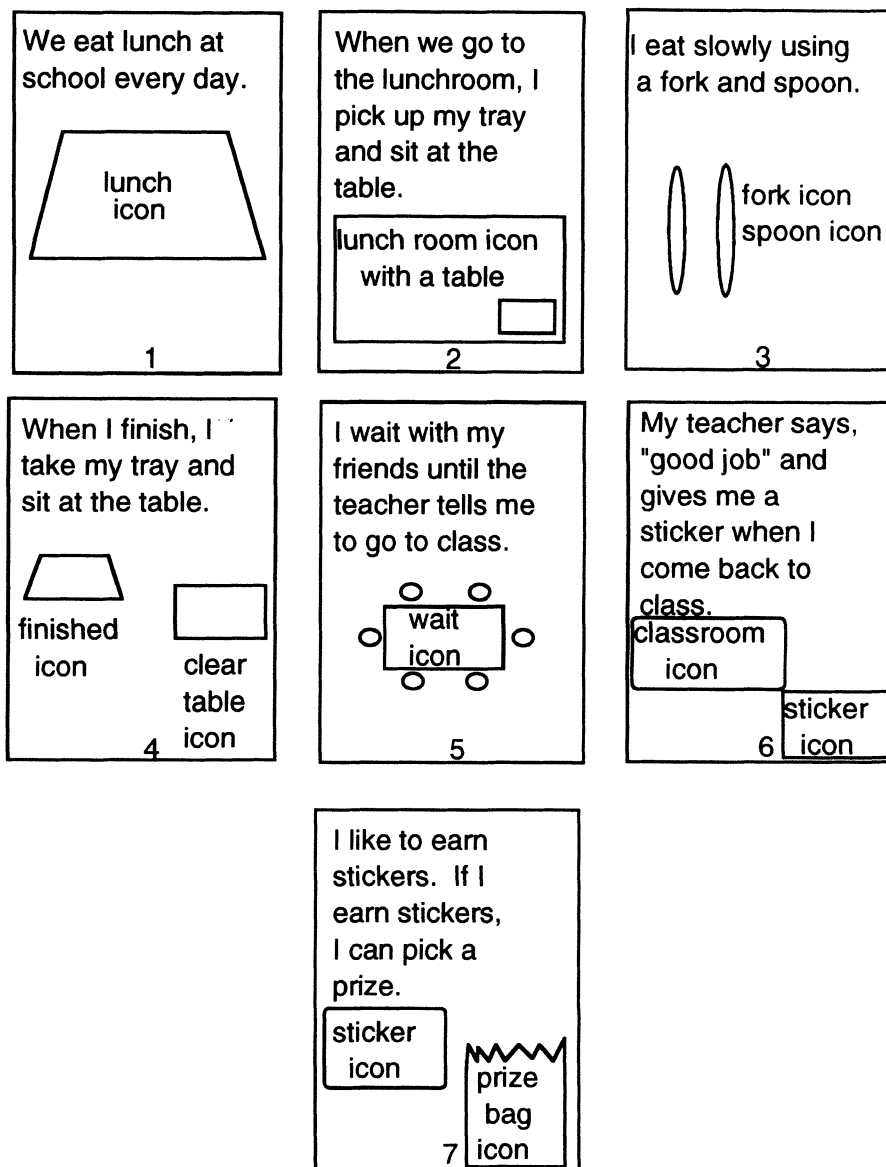


FIGURE 2. Lunch social story.

whether the intervention would have produced the same results across randomly selected participants and settings.

Participant's Functioning Level.

Gray and Garand (1993) found that social stories worked best with students who were higher functioning. Since their original work, some of the social story guidelines have been modified to fit the needs of individuals with more severe communication impairments. Using a book format with only one sentence per page and pictures to aid in understand-

ing the written words enabled individuals who were more severely impaired to benefit from the social story intervention (Swaggart et al., 1995). The student in this study had moderate mental retardation, with receptive communication skills that were much higher than his expressive skills. He was very proficient in using picture communication symbols, daily picture schedules, and picture communication books. Given the diversity of abilities that individuals with autism possess, it is not known if social stories could benefit all such individuals.

Time Span of the Intervention.

Data were taken for a period of 19 days. Clearly, an intervention across additional days might have produced different results.

Generalization/Maintenance.

Although social story use was successful for Jon in two school settings, it is impossible to know whether a similar strategy would be useful if Jon were to exhibit similar behaviors relative to other transitions. In addition, it is not possible to predict whether this strategy would be successful for other behaviors that Jon might exhibit. Similarly, the duration of time that the strategy may maintain its effectiveness for Jon is unknown.

Conclusion

For Jon, the social story intervention was effective in reducing precursors to tantrum behavior. This study points to an idea that visual representations of items may not be enough to help some students control their behavior. Jon had consistently used group and individual picture schedules to announce transitions. These schedules, however, had limited success in controlling his precursors to tantrum behavior. It was not until a social story was introduced that Jon's behavior changed. Thus, it may be that some students with autism require visual interventions along with directions, choices, or rationale to transition or manage their own behavior. The social story may be effective because it combines these elements to help the student know how to react to specific situations.

This study extends previous investigations of the positive effects of social stories, creating a larger database for other teachers and caregivers to refer to when considering alternative methods of instruction for students with autism. The social story method is easy to implement across many environments, it is virtually cost free, and it can be individualized to meet the needs of people with social interaction deficits. Future research is necessary to validate the effectiveness of this technique across settings and levels of functioning.

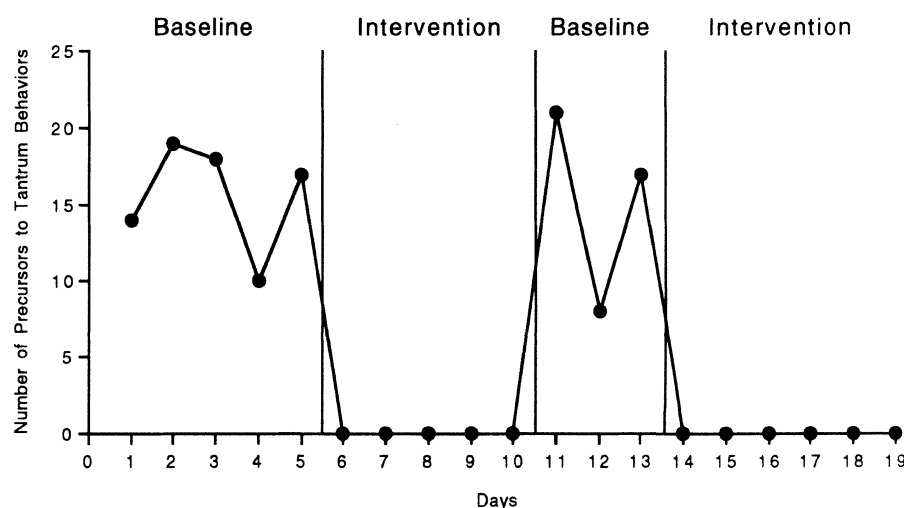


FIGURE 3. Number of precursors to tantrum behavior during morning work time.

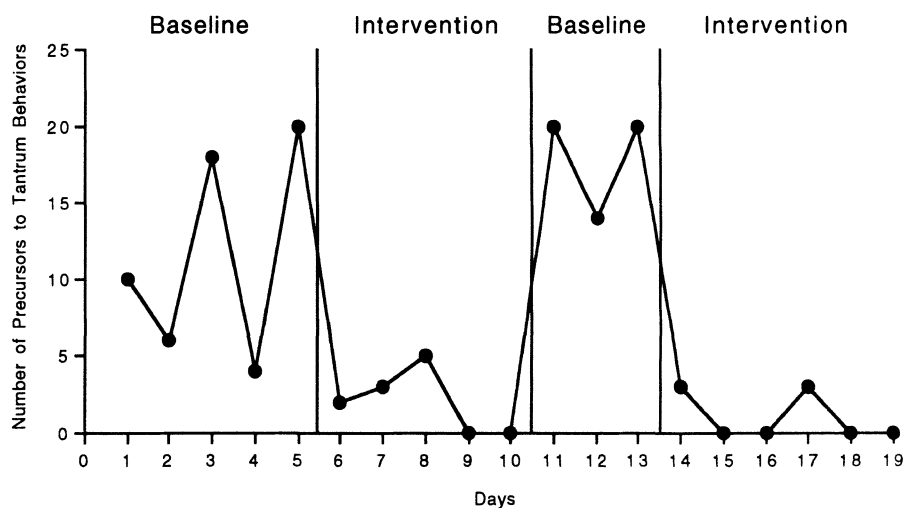


FIGURE 4. Number of precursors to tantrum behavior during lunchtime.

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