

Research Article

Utilizing Social Stories to Increase Prosocial Behavior and Reduce Problem Behavior in Young Children with Autism

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The purpose of this paper was to evaluate the effects of a Social Story intervention on the behavior rates of 4 young children with autism using a multiple-baseline across participants design. The results of this paper indicate that the Social Story was modestly effective in increasing prosocial behavior rates in 3 of the 4 participants, though none of the participants reached the prosocial behavior rates of age and gender-matched peers. The problem behaviors of the participants modestly decreased with the intervention. Maintenance of skills over a 1-month period was demonstrated for all of the participants. The variable and inconsistent results of the research add to the current literature base in support of the use of Social Stories for some children with autism.

1. Introduction

Autism is a complex neurological disability that is diagnosed in increasingly large numbers of children. The Centers for Disease Control [1] estimate that 1 in 110 Americans have an autism spectrum disorder (ASD). Children with ASD often lack the ability to understand another person's perspective, which can lead to problem behavior and social deficits [2]. Problem behavior may be the single most challenging characteristic in children with autism and includes screaming, crying, aggression, and sometimes self-injurious behavior [3]. Children with ASD often exhibit social deficits including decreased eye contact, poor play skills and an inability to interact with peers and form friendships, poor appreciation of social cues, and socially inappropriate behavior [3–6]. A teaching intervention of increasing popularity used to increase prosocial behavior and decrease problem behavior in young children with autism is Social Stories [7–10].

Social Stories are individualized short stories used to assist children with ASD in understanding social situations by describing and explaining appropriate behavior and providing examples of appropriate responses. Gray and Garand

[2] introduced the concept of Social Stories to decrease problem behavior in children with autism. Social Stories can be used to help children understand that other people have perspectives that may differ from their own, and that others have information that is helpful to them. These short stories outline specific steps for implementing the appropriate social skill and include short text and pictorial cues. The Social Story assists the child's accurate understanding of specific social information in a given setting or circumstance [11].

Social Stories may be a beneficial intervention for multiple reasons. First, Social Stories may help explain confusing situations and diffuse anxiety and problem behavior. Second, the Social Story uses visual learning strategies which are often a strength in children with autism [12]. Third, Social Stories do not require special training to implement and can easily be used across settings and implementers. Last, the Social Story is individually written with the child's interests and perspective in mind and can be accessed easily until the target behavior is mastered. Thus, Social Stories may be an effective intervention for children with autism. Social Stories are used extensively in the field with positive results [8, 10, 13, 14].

Social Stories are an intervention used increasingly with children with ASD and have been found by the National Autism Center to be an effective research-based intervention [7].

This discussion of the literature will only include peer-reviewed published studies that used an experimental design with sufficient experimental control (e.g., exclusion of case studies and AB designs) as recommended by leaders in the field [15, 16]. Many researchers have used Social Stories to decrease screaming and crying and aggression [17–20], or decrease inappropriate verbalizations [14, 21–23]. These studies have all shown decreases in these problem behaviors, with some variability of results.

Social Story studies have also used prosocial behavior targets including increasing peer interaction [22, 24–26], increasing appropriate play [27], increasing independent behavior [28], and increasing mouth wiping [29]. All of these studies reported increases in these prosocial behaviors with the Social Story intervention. One of the studies used typical peers as criterion measures [24], and the participants had increases in prosocial behavior that approached peer criterions.

Three studies evaluated the use of Social Stories in children not diagnosed with ASD [30–32]. In the first study of its kind, Burke and colleagues evaluated the use of Social Stories with typically developing children who were experiencing sleep disturbances. Results indicated that there was an immediate and significant decrease in problem sleep time behavior in the four children in the study. Soenksen and Alper used Social Stories to increase prosocial behavior in a 5-year-old with hyperlexia while Toplis and Hadwin reported increased prosocial behaviors in 3 of 5 boys in their study of five children with behavior difficulties.

The majority of the Social Story interventions have been implemented in the classroom setting, though Adams et al. [17] studied the home environment while Ivey et al. [28] had parents read the Social Stories prior to Speech Therapy sessions. Thiemann and Goldstein [26] trained typical peers as conversation partners for implementation of the Social Stories in the classroom.

Though the literature base for Social Stories has continued to grow and become stronger, some of the studies lack strong designs. There were vague descriptions of settings [17] and lack of demonstration of experimental control [18, 33, 34]. Adams et al. also did not adequately describe participant selection criteria. In two studies [24, 25], only two of the three participants had increases in the targeted prosocial behaviors while Toplis and Hadwin [32] increased prosocial behaviors in three of five boys in their study.

Many of the studies did not assess maintenance and/or generalization effects [21–23, 25] or reported anecdotally [17, 19]. Other researchers measured maintenance but found weak or inconsistent results [27, 29] or no maintenance of effects once the Social Story was withdrawn [20, 24, 28]. Thiemann and Goldstein [26] and Sansosti and Powell-Smith [24] found weak generalization results. Only one study [14] reported a strong maintenance effect.

The articles reviewed demonstrated positive outcomes with the use of Social Stories, though some suffered from

design weaknesses [17, 18, 24, 25, 34, 35]. Eight studies [18–20, 22, 26, 27, 30, 36] used interventions in addition to the Social Stories including verbal praise, video modeling, and prompts which prevented the authors from determining which intervention was responsible for effecting change in behavior. Although many of the studies demonstrated positive results, there is a wide range of experimental rigor and future studies must use appropriately stringent design to add to the growing literature base in support of Social Stories.

The purpose of this study was to evaluate the effects of a Social Story intervention on the social behavior rates of four young children with autism. This study used a multiple-baseline across participants design to evaluate the effects of the Social Story on the prosocial and problem behaviors of each of the participants in comparison to gender and age-matched peers in the inclusive preschool classroom.

2. Method

2.1. Instruments. Each child was assessed with The Social Responsiveness Scale [37] and the Carolina Curriculum for Infants and Toddlers with Special Needs [38]. The SRS is a 65-item interview tool that utilizes a standardized scale. The SRS results are divided into 5 subscales: (1) social awareness, (2) social cognition, (3) social communication, (4) social motivation, and (5) autistic mannerisms [37]. The portion of the CCITSN used in this study assessed the ability of the children to communicate functionally. For example, the participants demonstrated the ability to (1) understand “look”, (2) understand words that inhibit actions such as “wait, stop, get down, my turn”, and (3) follow commands in familiar contexts.

2.2. Participants. The participants for this study were selected from a public school system in a mid-western community. All participants were selected for this study based on teacher nomination after an initial screening with the Early Childhood Special Education (ECSE) Coordinator. From the pool of possible participants nominated by the ECSE Coordinator, the four children with autism were selected based on the following criteria: (1) 3 to 7 years old, (2) regular participation in an inclusive preschool, (3) current medical diagnosis of autism, and (4) ability to communicate functionally in at least the 21–24-month developmental age as measured by the CCITSN [38]. The decision about who to include in the study was based on Gray and Garand’s recommendation that Social Stories benefit children who possess basic language skills and are not severely mentally impaired [2]. Participants were free of vision, hearing, and severe motor impairments that would limit their participation in the proposed study. Written parent permission was obtained in for each child.

All four of the participants were males with previous medical diagnoses of autism who were being served by the public school district’s ECSE program. All four boys had target behavior of positive peer interaction and response to peer initiation which was defined by Cooper et al. [39] as follows: (1) request for peer attention unprompted by an

TABLE 1: Participant characteristics.

	Age	SRS	CCITSN	Problem Behavior
Nick	4 yr, 10 m	63	30–36 months.	Instances where there is no display of any verbal, physical, or gestural initiations or responses to peers as defined by no response to peer initiation
Logan	4 yr, 1 m	74	24–30 months.	Instances of negative verbal or physical behavior, instances where there is no display of any verbal, physical, or gestural initiations or responses to peers as defined by no response to peer initiation
Trevor	4 yr, 10 m	66	30–36 months.	Instances of negative verbal or physical behavior, instances where there is no display of any verbal, physical, or gestural initiations or responses to peers as defined by no response to peer initiation
Peter	5 yr	72	21–24 months.	Instances of negative verbal or physical behavior instances where there is no display of any verbal, physical, or gestural initiations or responses to peers as defined by no response to peer initiation

adult that is directed toward a peer by using his/her name or facing him/her in close proximity (e.g., “look”, “John”, “do you want to play?”), (2) uses gestures or vocalizations to establish joint attention with peer (e.g., holds object to show peer, taps shoulder, “good job” directed toward peer), (3) understandable answer that is unprompted by an adult, that is directed toward a peer by using his/her name or facing him/her in close proximity, and (4) a positive behavioral response to peer initiation (e.g., scoots over for peer to sit, lending toy, cooperatively building block tower, turn taking). There are additional characteristics of the participants described in Table 1.

Nick. Nick spoke in short complete sentences and was at or above age-level in all academic readiness tasks. The teacher reported that Nick is mostly playing alone with no favorite peers, using toys in a simple way such as rolling a car back and forth and occasionally participating in pretend play such as using a farm with farm animals. He had difficulty initiating and responding to conversation and play with peers.

Logan. Logan answered *yes* and *no* questions appropriately, made verbal requests not directed to a person, and often spoke from movie scripts. He was able to compose simple sentences but had difficulty with semantics. The teacher reported that Logan mostly played alone but would occasionally hand or receive a toy from a peer in the classroom. He did not initiate or respond to peer play activity in the preschool classroom and frequently spent time wandering unengaged during free play. The use of a visual schedule was used as a cue for Logan to engage in an appropriate activity.

Trevor. His teacher reported that he was a reader and that all academic skills were at age-level or above. Trevor used age-appropriate sentence length and structure except for difficulty with pronoun usage and semantic functions. He had some difficulty initiating and sustaining conversations, though he would make requests and answer questions appropriately with adults. The teacher reported that Trevor preferred to play alone and did not seem to notice peers in the classroom. Some negative behavior was observed such as taking toys, pushing, and not responding to peer initiations.

The teacher indicated that many of the peers in the classroom chose to play at a distance from Trevor due to his negative peer behavior.

Peter. Peter was able to answer *yes* and *no* questions but required prompting for simple requests and one-step commands, combined with gestural cues. He occasionally used simple sentences for requests. His teacher reported that Peter played alone and did not initiate play with peers in the classroom. He would often grab toys from peers, hit, kick, or push peers when they came near him, and he often walked away when peers came close to his play area. Peter also wandered unengaged and often escaped from activities and even the classroom during free play.

Peers. After the children with autism were identified, peers with average social skills were chosen by teacher nomination from the ECSE classrooms. Peers were chosen by teacher nomination using the following criteria: (a) average social skills as assessed by the teacher, (b) age matched to participants within 6 months [40], (c) gender matched, (d) demonstrated regular attendance, (e) parent or guardian written consent to participate in study, (f) compliant to adult instructions, and (g) willing to participate in study. A median was calculated for typical social behavior based on the social behavior of the participants.

Teachers. Three of the children shared the same teacher: Logan, Trevor and Peter. Logan was in preschool in the afternoon, while Trevor, and Peter attended preschool in the morning. The ECSE teacher who read the Social Stories each day for the three participants had Master’s Degrees in Education and Communication and Science Disorders with certification in Early Childhood Special Education (ECSE), and licensure as a Speech and Language Pathologist. She had been teaching in ECSE for 5 years and worked part-time as an SLP for 4 years.

Nick’s primary teacher had a Master’s Degree in Education with 6 years experience teaching in the preschool setting. The Social Story was read daily by Nick’s ECSE teacher who spent varying amounts of time in his classroom daily.

2.3. Settings. All baseline and intervention sessions took place during free play in the preschool classroom because this was the time and setting identified as problematic for all participants. Nick's preschool classroom consisted of 12 typically developing peers. All children were from 2 years, 6 months to 3 years, 11 months. Logan and Trevor were in the same preschool classroom. There were a total of 11 three- to five-year-old children in the class, including three typical peers. The other children had diagnoses of general language, cognitive, or motor disabilities. There were a total of 7 three- to five-year-old children in Peter's preschool classroom including one typical peer. The other children had diagnoses of language, hearing, or cognitive impairments.

2.4. Materials and Measures

Observation of Peers. Observation of two comparison peers per participant was included to determine median levels of social interactions in which typical peers engage. The peers were observed five times for 10 minutes each during free play during the baseline phase of this study.

Independent Variable. The intervention of the Social Story was the independent variable. The Social Story was read by the teacher in the preschool setting during free play for each child. The construct validity of each Social Story was assessed with the Social Story Construction Checklist by an independent professional with a Master's Degree in Special Education who had extensive experience with the use of Social Stories as an intervention with children with autism. The Social Story Construction Checklist consisted of questions concerning the correct sentence ratio and the ability of the Social Story to target the specified prosocial and problem behaviors identified for each child [24].

Copies of the Social Stories were sent home for the families to read with the child, and the Social Story was available at all times in the classroom throughout the intervention and maintenance phases. Anecdotally, the parents of all participants reported that the Social Story was frequently accessed at home. The teacher reported that only Logan and Trevor accessed the Social Stories occasionally in the classroom.

Social Story. The Social Story was type written in 16-point Times New Roman font on white 5 1/2 inch (width) × 8 inch (length) cardstock, laminated and fastened by spiral binding on the left margin. There were 5 to 11 pages in each Social Story. Photographs of the child and peers were included in each Social Story to increase the communicative intent of the story for all the books except Nick's. Photographic releases were not able to be obtained for the peers in Nick's classroom; therefore his Social Story only contained photographs of himself and his teacher. Due to the limited visuals for Nick's Social Story, picture symbols were utilized for his book from the Mayer-Johnson Writing With Symbols Windows Program [41]. Each child had two individual Social Stories written, for a total of eight Social Stories (see the Appendix).

The classroom teacher was asked to introduce the story to the preschool participant with the phrase, "I wrote this story for you" [42]. The teacher then sat to the child's side and slightly back, or the child sat in the teacher's lap while the story was read aloud by the teacher (Gray). Comprehension was assessed during each intervention by having the child answer questions about the Social Story, and/or role play [22, 43]. All children demonstrated 100% comprehension from each intervention session. The Social Story was read at least once a day, at the same designated time each day during free play, until the maintenance and fading phase of the study.

2.5. Experimental Design. A multiple baseline design across participants was utilized for this study [15]. The experiment was composed of four phases. The first phase (A1) was baseline where the observer recorded the frequency of prosocial behaviors and problem behaviors. The second phase (B1) was intervention 1, the Social Story, while the third phase was intervention 2, the modified Social Story (B2). The final phase (A2) evaluated the maintenance of the intervention. Treatment sessions commenced with the first participant once a stable baseline was reached for the dependent measure. Visual analysis was utilized to identify appropriate phase changes.

Fidelity of Treatment. The teacher recorded whether or not the Social Story was read to the child that day at the specified time during free play and whether comprehension questions were asked. For at least 25% of the intervention sessions, the researcher was present to record on a checklist the treatment integrity, while the teacher completed the checklist 100% of the time.

Interobserver Agreement. Prior to beginning the study, three observers were trained to reliably record behaviors. The two primary data collectors were the researcher and a doctoral student in special education with experience in data collection. The third observer was one of the classroom teachers. The observers read the target behavior definitions and became familiar with the data collection forms and procedures for recording observations [39]. The observers then practiced observing and recording data in the free play setting defined for each participant. All three observers established a criterion of 100% agreement for three consecutive sessions [39]. The three researchers viewed social interactions in the inclusive preschool classroom and recorded observed behaviors for each targeted skill. Interobserver agreement checks were conducted for at least 1/3 of the observation sessions to insure the integrity of data collection across each participant in each condition of the study [15].

Interobserver agreement for observations was calculated to assess the reliability of the data. Reliability checks occurred for at least 30% of baseline condition, 33% of intervention sessions, and 40% of maintenance condition for each child. Observations were considered reliable if at least 80% interrater agreement was achieved for each observation. Interrater

agreement was consistently above 80% for all participants. Agreement in each condition ranged from 90% to 100% for Nick ($M = 95\%$), 82% to 100% for Logan ($M = 93\%$), from 88% to 100% for Trevor ($M = 98\%$), and 93% to 100% for Peter ($M = 97\%$).

Construct Validity. The construct validity of each Social Story was assessed with the Social Story Construction Checklist and found to comply 100% of the time with the correct sentence ratio and target for specified prosocial behavior.

Procedural Reliability. A Treatment Fidelity Checklist was used to determine the fidelity of the intervention. Procedural reliability was computed as a percentage by dividing the number of days the participant was present and available in the preschool free play setting divided by the number of days the participant was read the Social Story multiplied by 100. Treatment fidelity for all participants was 100% as recorded by the teachers. The researcher was present for 100% of interventions for Nick, Logan, and Peter and 58% of interventions for Trevor.

2.6. Experimental Procedures

Baseline. There were two variables of interest: target prosocial behavior and problem behavior. During baseline, observational data were recorded for each participant's target behavior and problem behavior for 10-minute periods at least three times a week in the free play setting until baseline data were determined to be stable with at least 5 data points [15]. Observations of the five comparison peers were also conducted in the free play setting during the baseline period. No intervention occurred during this period. If any instance of the target prosocial behavior or problem behaviors occurred during the 10 minute observation, the observer recorded the behavior on the data collection sheet.

Intervention. Once baseline data were stable, intervention 1 (I1) began, which was reading of the Social Story. Data were collected for six data points [31]. When six data points were collected during I1 and the child had not met the prosocial median criterion rate of target behavior, then the Social Story was revised as recommended by Gray [42] for Intervention 2 (I2). Revisions were made to the individual Social Stories after discussing appropriate changes with the classroom teacher. For example, Nick's initial Social Story had a sentence that said, "I can try to go up to one of my friends, stand close, look at my friend and say, "Will you play with me?" This sentence was changed to, "If a friend comes over while I'm reading a book, I can scoot over and ask my friend to read with me" with the modified Social Story in I2. Data were then taken for an additional 6 data points.

Maintenance. After intervention, the Social Story was then discontinued in the classroom and the maintenance phase began. Probes were utilized in the preschool classroom to

determine if behavior changes were durable over a one-month period. Five probes took place for each participant in the free play setting over a variety of days throughout the four weeks. Data collection consisted of 10-minute event recordings in the free play setting for each child.

2.7. Data Analysis. Each participant was the component of analysis, serving as his own control [15]. All visual inspection analyses included both the changes in individual participant's data as well as comparing changes across each of the additional participants. In addition, observational data were analyzed to determine the percentage of nonoverlapping data (PND) points for each participant between baseline, intervention 1, intervention 2, and maintenance. Nonoverlapping data points were computed by comparing data points in intervention 1, intervention 2, and maintenance with baseline.

3. Results

Research Question 1. Does Social Story intervention increase socially appropriate behavior and decrease problem behavior in preschoolers with diagnoses of ASD and are these effects maintained over a one-month period?

Nick. Figure 1 indicates that with implementation of the Social Story, there was a slight increase in prosocial behaviors in I1. The modification of the Social Story for I2 indicated a somewhat variable though slightly increasing rate of instances of prosocial behavior over baseline. Maintenance data were also variable, with a general increasing trend of prosocial behaviors over baseline.

The percentage of nonoverlapping data (PND) points were calculated by counting the data points in the intervention that were higher than the highest data point in baseline, dividing this number of nonoverlapping data points in the treatment series by the total number of data points in the treatment series and multiplying this number by 100 [44, 45]. An intervention with a PND of 90% or greater is considered highly effective, 70–90% is considered moderately effective, 50–70% is considered mildly effective, and less than 50% is considered ineffective as effects can be contributed strictly to chance [45]. From baseline to I1, the PND was 67% and subsequently rose to 83% from baseline to I2, indicating a moderate effect. From baseline to maintenance, the PND was 80% which also indicates a moderate effect. These data indicate that the Social Story was mildly effective for Nick in I1 and moderately effective in I2 and maintenance.

Figure 2 indicates that there was an immediate decrease to zero problem behaviors with the implementation of I1. Though the data were variable, Nick had a decrease in problem behaviors, with no problem behaviors in maintenance.

Logan. Logan had a very stable baseline with only one instance of any target prosocial behaviors. As demonstrated in Figure 1, Logan had an immediate increase in prosocial target behaviors from baseline with a positive slope. Following introduction of I2, there was an immediate increase in target behaviors, followed by a decreasing trend in target

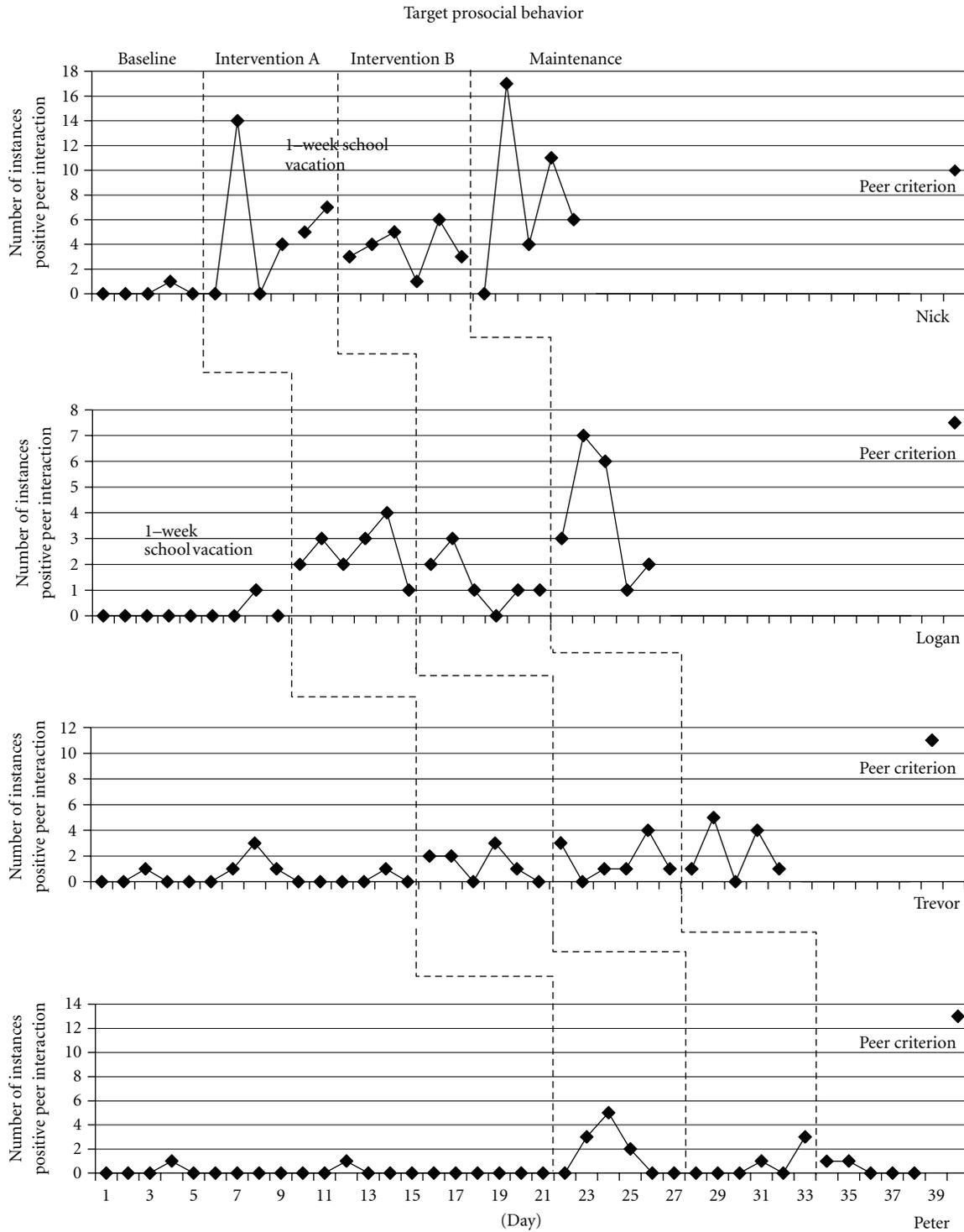


FIGURE 1: Target prosocial behavior.

behaviors, indicating a decreasing effectiveness of I2. Data collection in maintenance indicated an immediate increase in target prosocial behaviors.

The PND for Logan’s data was 60% from baseline to I1, indicating a mild effect. From baseline to I2, the PND was only 17%, which is considered ineffective, as there were only

two data points above baseline. These results indicate that the modified Social Story in I2 was not effective for increasing Logan’s prosocial behaviors. The PND from baseline to maintenance was 60%, which indicates that the intervention was mildly effective in maintaining prosocial behavior after the Social Story was discontinued.

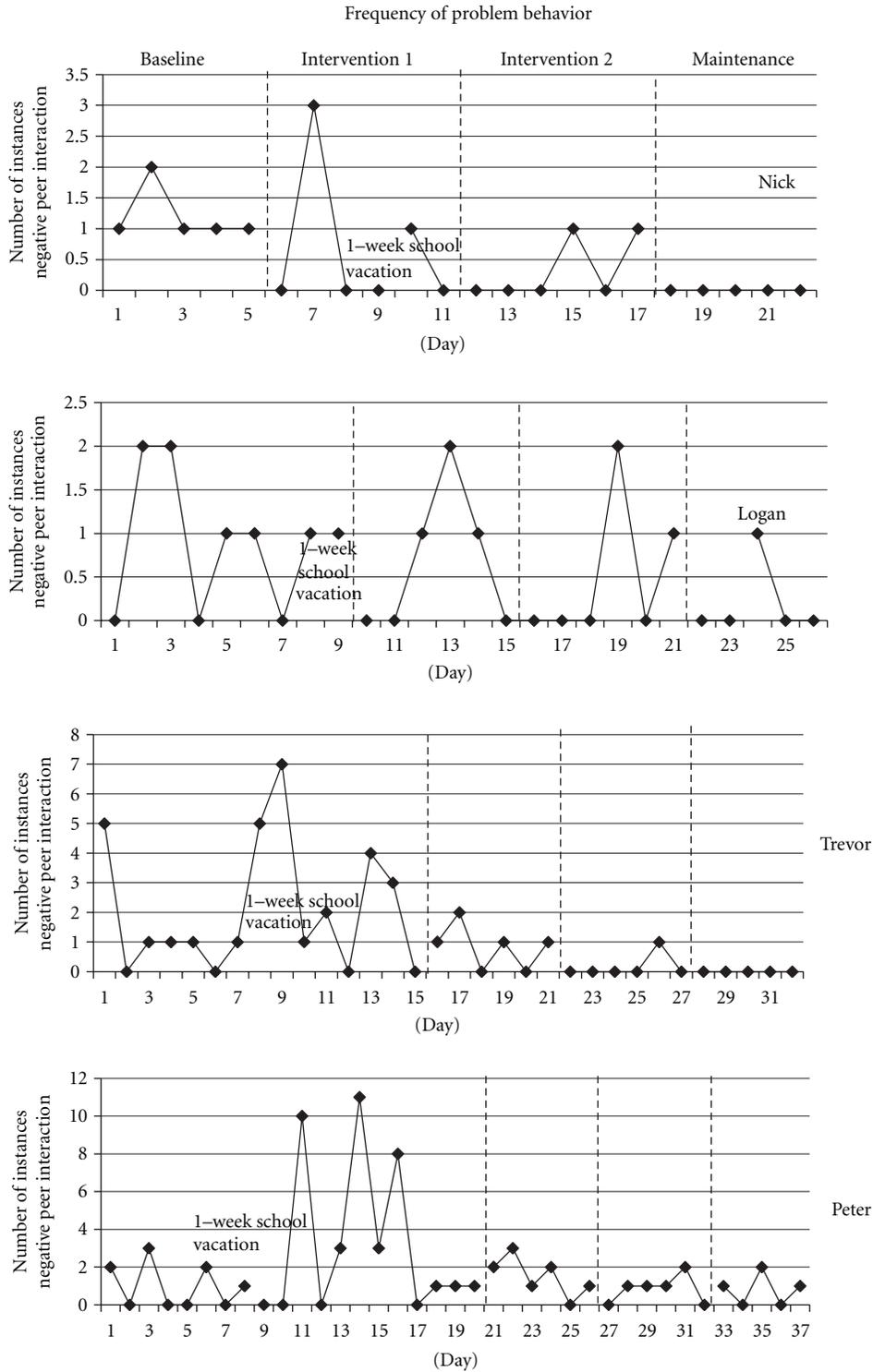


FIGURE 2: Frequency of problem behavior.

Logan’s problem behavior was variable in baseline and intervention phases. It is most stable in the maintenance phase, where at 4 out of 5 days there was no problem behavior.

Trevor. In reviewing Figure 1, I1 and I2 show a slight increase in prosocial behavior from baseline, though it is

inconsistent. The maintenance phase is also variable, with the highest rate of prosocial behavior of all phases, but the behavior does decrease over time.

The PND for all phases of Trevor’s data was insignificant. The data points overlapped 100% from baseline to I1, while there was an 83% overlap from baseline to I2 and 60%

overlap in maintenance from baseline. The PND indicates that there was not a significant effect of I1 or I2 on Trevor's prosocial behavior.

There was a decrease in Trevor's problem behavior from baseline to I1, I2, and maintenance. Though the data were somewhat variable, with instances of no problem behavior in all of the phases of the study, visual inspection reveals a downward trend in problem behavior in I1 and I2. There were no problem behaviors in maintenance.

Peter. The data in Figure 1 indicate that upon implementation of I1, there was a slight increase in prosocial behaviors, followed by a decrease back down to zero. During I2, there were only two days of any prosocial behaviors. With discontinuation of the Social Story, there were two days of prosocial target behaviors.

The PND was only significant from baseline to I1, where it reached 50%, which is considered mildly effective. There were only 17% nonoverlapping data from baseline to I2 and 0% from baseline to maintenance. These data indicate that I1 was mildly effective, but I2 was ineffective, and there was no effect in maintenance.

Visual analysis indicates that problem behavior was variable in all phases, but there was a decrease in frequency with intervention. Peter had an increase in problem behavior following the one-week spring break vacation period, which the teacher noted occurred after a prolonged period out of the classroom.

Research Question 2. In preschoolers with diagnoses of ASD, do the social behavior rates approach those of age and gender-matched typically developing peers?

Of the four participants Nick was the closest to approaching the social behavior rate of age and gender-matched typically developing peers. On two occasions, Nick exceeded this rate though Nick's median rate of prosocial behavior fell below that of his matched peer. Logan, Trevor, and Peter did not meet or exceed the age and gender-matched peer criterion prosocial behaviors in any phase.

Research Question 3. Do teachers support the social validity of social stories?

After the intervention and maintenance sessions were completed, teacher satisfaction was assessed by a six-item questionnaire that used a 5-point scale to rate: (1) Social Story effect on the child, (2) carryover to other activities and/or settings, (3) ease of implementation, and (4) overall experience. The scale used for this tool was a Likert-type rating as follows: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, and (5) strongly agree. Both of the teachers strongly agreed with the statements that the Social Story intervention was easy to implement and that most teachers would find the intervention appropriate for a wide-range of behaviors and they would be willing to utilize the intervention again. Peter's teacher was neutral on the question of effectiveness of the intervention, though she did agree that the intervention was acceptable for the child's behavior difficulties. The other teacher either agreed or strongly agreed that the Social Story was effective. The

teachers either agreed or strongly agreed that they would recommend this intervention to other teachers.

4. Discussion

The purpose of this study was to determine if using a Social Story as the sole intervention was effective in increasing prosocial interaction and decreasing problem social behavior in 4 preschoolers with autism. The results indicate that the Social Story did result in slight increases in prosocial behavior for 3 of the 4 children and some decreases in negative social interaction for all 4 of the children. The modest and inconsistent effects of the Social Story intervention are consistent with past research. The specific results are discussed hereinafter.

4.1. Increasing Prosocial Behavior. The results of this study indicate that the Social Story as a sole intervention did increase the prosocial behavior in varying though small degrees for 3 of the 4 participants. Other authors have had similar results when utilizing Social Stories without other supports [24, 25]. However, the increases in prosocial behavior were modest and none of the children approached the mean of their typically developing peers. This is not surprising given that deficits in social communication are one of the core features in autism. One of the reasons for including target levels based on the behavior of classroom peers is to ensure that our expectations for social behavior are socially valid. In this study our micronorms were based on children who were identified by teachers as being "average" in their social behavior. For children who have very low rates of prosocial behavior initially and have a disability with deficits in social communication as one of the identifying characteristics, "average" rates of social interaction may be an unrealistic criteria. Sansosti and Powell-Smith [24] had similar inconsistent results in their study of three elementary-aged children with Asperger's syndrome where only 2 of the 3 participants met or exceeded the criteria some of the time. Although having typically developing peers as the standard makes sense, it may be too rigorous a standard when used to decide whether or not an intervention has merit.

One of the benefits of using Social Stories is that they are relatively easy to make and easy to implement. As a sole intervention, particularly for young children with autism, Social Stories may be an important component, but just one piece of a more intensive systematic intervention program that includes direct teaching of the targeted behaviors. It seems likely that combining Social Stories with video [26, 36], prompting [22, 26], or response-cost systems [46] would have resulted in more robust results. We chose to not add other interventions as recommended by Ali and Frederickson [13], Nichols et al. [8], and Reynhout and Carter [9] in order to help determine the relative effectiveness of the Social Story. When multiple interventions are implemented concurrently, it is not possible to disentangle the relative contributions of each.

The inconsistent results in the published literature and in the current study make it important to identify the

characteristics of children who will respond well to Social Stories. Unfortunately, our study does not help to answer this question. Since 3 of the 4 participants did have modest increases in prosocial behaviors, it is unclear which children benefit from Social Stories more than others. Scores on The CCITSN did not help predict which children would respond to the Social Story intervention. For instance, Nick and Trevor both scored in the highest range (30 to 36 months), yet Trevor did not demonstrate significant increases in prosocial behavior. It is also possible that the children who benefited from the Social Story intervention had the skills but did not use them until implementation of the intervention. The particular setting of the children in this study may have affected the results. Nick, who had the greatest prosocial behavior increase, was in a classroom with all typically developing peers. Trevor and Peter were in the same morning class and had higher gains in prosocial behavior than Logan. Perhaps the morning class had peers that positively reinforced prosocial behavior from the participants. It is also possible that the teacher gave more attention to the children in the study in addition to the Social Story, which may have affected the results of this intervention. An additional consideration is that Social Stories may be more effective in reducing inappropriate social behaviors rather than improving appropriate social behavior as discussed below.

4.2. Decreasing Problem Behavior. All four participant's problem behavior decreased modestly with the Social Story intervention. Due to the highly variable nature of behavior, it was apparent that problem behavior frequency was inconsistent for each of the participants throughout the phases of the study. It is notable that there was a possible floor effect for problem behavior instances, and this should be considered when evaluating the effectiveness of the intervention in reducing problem behaviors. Nick, Trevor, and Peter had the largest decreases in no response or negative responses to peers with the introduction of the Social Story, and these behaviors continued to decrease with intervention 2, though the behaviors were inconsistent. These results differ from the results on prosocial behavior discussed previously, where intervention 2 did not improve results. These data indicate that the modification of the Social Story was somewhat effective in decreasing problem behaviors, though the modification may not be effective in increasing prosocial behaviors. The results from this study replicate previous literature on the effectiveness of utilizing Social Stories to decrease problem behavior in children with autism [14, 19–22].

This study used Gray and Garand's [2] recommendation that the Social Story be modified if optimum results are not obtained and isolated the use of the Social Story without adding reinforcers or other confounding variables that have often been reported in the literature [25]. The results of this study indicated that it was not beneficial to modify the Social Story according to Gray and Garand's criteria, as there were not continued increases in prosocial behavior. It may be that instead of changing the Social Story, a different

intervention may be necessary (e.g., prompt and praise). Problem behaviors did continue to modestly decrease with the modified Social Story, a result that is desirable in many instances.

4.3. Maintenance. After I2, the Social Story was faded for each participant while maintenance data were taken over a one month period. The maintenance data for this study were extremely encouraging. In fact, Nick, Logan, and Trevor had the highest mean prosocial behaviors in the maintenance period. Nick and Trevor had a mean of zero instances of negative behavior in maintenance. These findings are noteworthy in that prior studies utilizing Social Stories have not supported the maintenance of skills [24, 26]. Crozier and Tincani [14] reported maintenance effects in their study utilizing Social Stories with children with autism and this current study adds to the literature in support of maintenance effects of Social Story intervention. Anecdotally, the teachers indicated that the 3 children that had positive social gains with Social Stories had the targeted prosocial skills prior to implementation of the Social Story, but they did not use these skills consistently. It may be that these children had the skills but needed the Social Story to give examples of how to appropriately use the prosocial behavior in the classroom. Even once the Social Story was removed, the children still used these skills at a higher rate because they had learned how to appropriately use the social skills in the classroom.

4.4. Treatment Integrity and Social Validity. The Social Story intervention had acceptable treatment integrity and was rated as highly acceptable by the teachers. This is important as the teachers were the implementers of this intervention. These results add to the current literature base that report social validity from a teacher's perspective [47].

4.5. Limitations. Though the findings from this study are promising, there are several limitations. Both the small number of participants and the modest, inconsistent results make it difficult to generalize these findings to other children. In addition, we were unable to identify the characteristics that may help to predict which children will benefit from this intervention. Therefore, some caution must be taken in generalizing these findings to other students, types of disabilities, settings, or behaviors. The results of this study are important and help to make clear the benefits and the limitations of this particular intervention. Social Stories may have only modest effects for the types of children in this study, the study environments, and variables included. Second, the fidelity of treatment may have differed among the participants in the study. Only two teachers participated in this research. Two of the children in this study were in the same morning classroom, and a third participant also had this same teacher in the afternoon. Thus, three of the four children (Logan, Trevor, and Peter) in the study had the same teacher. It is unknown if how the teacher presents the Social Story, asks comprehension questions, and provides other extraneous variables may affect the results of

a study. In addition, the teachers may have provided extra attention to the children with the addition of the Social Story intervention, and this can be a confounding variable. Also, though this study incorporated a treatment fidelity checklist, it only assessed whether the Social Story was read and if comprehension questions were asked. Future studies may need to address essential features of Social Stories through a more comprehensive treatment fidelity assessment. Though the researcher provided copies of each Social Story for home use, there was no formal assessment of how often the Social Stories were read in the home environment. Finally, we did not collect generalization data in a variety of settings as recommended by previous reviews of the literature [8, 48]. Anecdotal evidence from Nick's teacher did support the generalization of treatment gains. She stated that on two separate days she noted Nick asking peers to play during outdoor recess, which she had not observed prior to the intervention implementation.

4.6. Implications for Practice. There are several implications for practice concerning the results of this study including the call for Evidence-based practice (EBP), Social Story implementation characteristics, and the social validity of the intervention. Practitioners are utilizing Social Stories as an intervention for children with ASD yet with limited empirical support [8, 10, 48]. This study utilized rigorous experimental control which resulted in modest increases in prosocial behavior in three of the four participants and inconsistent decreases in problem behaviors in all four participants. This study raises a question about the appropriate use of peer norms for social behavior and how to determine whether an intervention is determined to be effective. Our results contribute to the body of work documenting that young children with autism need considerable instruction and support to interact appropriately with their peers. It seems likely that Social Stories may be part of a broader, more intensive set of strategies, but not enough as the sole intervention. The results also demonstrate that if the Social Story is not effective by itself, adding a different intervention rather than just changing the Social Story may yield more robust outcomes.

5. Recommendations for Future Research

It is important that future research efforts evaluate the maintenance and generalization of intervention effects. Kuttler et al. [20] found generalization of effects of Social Stories, but these results have not been replicated. There is support for the maintenance of the effects of Social Stories [14], but some reports have been anecdotal [27] or weak and inconsistent [26]. Future studies should assess maintenance after fading the Social Story and also evaluate the effectiveness of Social Stories in a variety of settings, or with a variety of behaviors.

Next, future research should evaluate the critical components required for effective Social Story implementation and how or when to use Social Stories as part of a larger intervention. This study revealed that modifying the Social Story per Gray and Garand's [2] recommendations did

not result in increased prosocial behaviors. It may be that Social Stories are most effective as less intensive supports or reminders, during the generalization or maintenance phases of more intensive instructional strategies that have been successfully implemented. It is also imperative that researchers evaluate what are critical components of the Social Story intervention including number of days read, types and quality of comprehension questions, sentence ratios and types, and number and type of illustrated examples. These are many variables that have not been isolated in the current Social Story literature. The results of these types of studies can reveal the critical components for successful implementation of Social Stories [8, 10, 13].

It will be important for future researchers to continue to study peer micronorms on social behavior. Since no data could be located concerning micronorms for target prosocial behavior studied in the current research, it is imperative that researchers continue to include peer data in future studies. Only by understanding acceptable peer norms for social behavior can researchers select appropriate prosocial behavior targets for participants in studies.

Finally, since the treatment effects were variable across the four participants in this study, it is critical to determine who best benefits from Social Stories. It is essential to determine why one participant benefits from the intervention greater than another. In this study, neither the SRS nor the CCITSN scores appeared to predict increases in prosocial skills. Future research should identify the characteristics of children who respond to Social Stories. It is important for future researchers to assess the use of Social Stories with a variety of children with varying skills and diagnoses.

6. Summary

This study evaluated the effects of a Social Story intervention in four young children with ASD. The results of this study add to the current small though growing literature base in support of the use of Social Stories for some children. Though the results are promising, the current research must be replicated while addressing future research needs.

Appendix

N Plays in Preschool

Hi, my name is -----.

I go to preschool.

Sometimes, I play alone in preschool.

Sometimes, I read with my teacher.

I can try to go up to one of my friends, stand close, look at my friend and say, "Will you play with me?"

My friends like to play with me.

When a friend calls my name, I should look at my friend and say, "Hi."

It is good to talk to my friends.

If a friend comes close to me, I can say, "Want to play?"

It is good to play with friends in preschool.

N Plays with Friends in Preschool (Modified)

Hi, my name is _____. I go to preschool.

I like to read books with my teacher at preschool.

If a friend comes over while I'm reading a book, I can scoot over and ask my friend to read with me.

My friends like to sit and read books with me.

After I read one book, I should try to go play with my friends.

My friends like to play with me.

I can try to go up to one of my friends, stand close, look at my friend and say, "Will you play with me?"

It is fun to play with friends in preschool.

When a friend calls my name, I should look at my friend and say, "Hi. Do you want to play with me?"

It is good to talk and play with my friends at preschool.

Playing with friends in preschool is fun.

L Makes a Plan, Stays, and Plays

Hi, my name is _____. I like to go to preschool.

I make a plan with my teacher in preschool.

I should try to go to the area in my plan.

It is good to stay and play when I make a plan.

When a friend tries to hand me a toy, I can hold out my hand and say, "My toy."

It is good to share and talk to my friends.

Sometimes I may want a toy my friend is playing with.

I can hold out my hand and say, "My turn."

It is fun to stay, play and talk to my friends in preschool.

L Makes a Plan, Stays, and Plays (Modified)

Hi, my name is _____. I go to preschool.

I should try to join friends when I play at preschool.

My friends like to play with me in preschool.

When a friend tries to hand me a toy,

I can hold out my hand and say, "My turn."

It is good to join my friends and share and talk.

Sometimes I may want a toy my friend is playing with.

I can hold out my hand and say, "My turn."

It is fun to join my friends to play and talk in preschool.

T Shares in Preschool

Hi, my name is _____.

I go to preschool.

It's fun to play with toys in preschool. Sometimes, I may want a toy my friend is playing with.

I can hold out my hand and say to my friend, "Can I play with the toy now?"

My friends like to play with me when I share.

Usually, sharing and taking turns is a good idea.

Sometimes a friend may try to hand me a toy.

If a friend tries to hand me a toy, I can hold out my hand and say, "Thank you."

Sometimes a friend may want a toy I am playing with.

If a friend tries to take my toy, I can say, "It's my turn to play with the toy."

It is good to share with my friends in preschool.

T Shares in Preschool (Modified)

Hi, my name is _____. I like to go to preschool.

We have fun playing with toys in preschool

Sometimes, my friend is playing with a toy I want.

I can hold out my hand and say to my friend, "Can I play with the toy now?"

My friends have fun and like to play with me when I share.

Sharing and taking turns is usually a good idea.

Sometimes a friend tries to hand me a toy. If a friend tries to hand me a toy, I can hold out my hand and say, "Thank you."

Sometimes a friend may want a toy I am playing with.

If a friend tries to take my toy, I can say, "It's my turn to play with the toy."

It is nice to share with my friends in preschool.

P Stays and Plays

Hi, my name is _____.

I like to play with toys.

My friends like to play too.

Sometimes a friend wants my toy.

I can say, "I want toy."

Sometimes a friend gives me a toy.

I can say, "I want toy."

It is good to stay and play with my friends at preschool.

P Stays and Plays (Modified)

Hi, my name is ----- I go to preschool.
 It is fun to play with toys.
 My friends like to play with me.
 Sometimes a friend wants my toy.
 I can say, "I want toy."
 Sometimes a friend gives me a toy.
 I can say, "I want toy."
 It is good to stay and play with my friends at preschool.

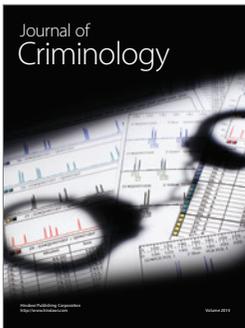
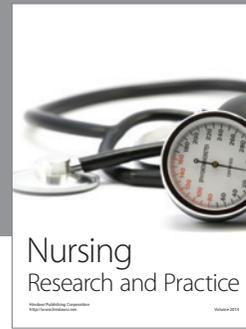
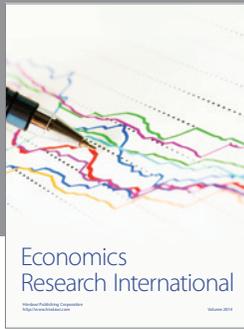
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