Group Delivered Literacy-Based Behavioral Interventions for Children with Intellectual Disability

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Abstract: This study was conducted to examine the effects literacy-based behavioral interventions have on improving the behavior of students with intellectual disability. A second purpose of this study was to determine if literacy-based behavioral interventions could be an effective intervention strategy when used simultaneously with a group of students targeting the same behavior. A multiple baseline design across small groups was used to assess whether the group delivered story intervention would decrease the negative behaviors of the five participants in this study. Results showed that the behaviors decreased for all five students.

In the early 1990s, Gray and Garand developed social stories™ to be used specifically as an intervention to help children with autism understand, correctly participate in, and respond to various social situations. Students with autism are not the only children who struggle with social skills deficits. Children with emotional behavioral disorders, attention deficit hyperactivity disorder (ADHD), intellectual disability, and learning disabilities also struggle with understanding and appropriately responding in social situations (Brown, 2001; Hall, Peterson, Webster, Bolen, & Brown, 1999; Vaughn, Haager, Hogan, & Kouzehanani, 1992). Students with different disabilities have difficulties functioning in social situations and may benefit from a social story™ intervention.

Gray and Garand (1993) used social stories™ that were presented to one student targeting one specific behavior. They developed suggested guidelines for writing a social story™. According to Gray (1995), a social story™ should be an individually written story that describes a specific situation in which the child is having difficulty, social cues that are relevant to the situation, and expected responses to the situation. Gray also suggests specific types of sentences to be used when writing a social story™ along with a ratio of each type of sentence. Gray describes the sentence types as descriptive, perspective, directive, and affirmative. Social stories™ are a relatively easy strategy to implement with a student. They are not time intensive in their development or use and can be used for a wide variety of situations and behaviors (Reynhout & Carter, 2006). Social stories™ can also be used with individuals with a wide range of ages. Finally, social stories™ can be developed for children in the mild to moderate range of cognitive functioning and who have basic language skills (Gray & Garand).

Gray and Garand (1993) developed social stories™ to help children with autism correctly use social skills to participate in social situations. Social skills are described as “the cognitive functions and specific verbal and nonverbal behaviors that an individual engages in when interacting with others” (Gut & Safran, 2002, p. 88). Difficulty in understanding and responding in social situations can occur in a number of ways, including, sharing, taking turns, conflict resolution, adapting to routines, making choices, understanding body language, facial expressions, and gestures (Gut & Safran). Gut and Safran (2002) list other social skills which are a critical component to the school setting, such as, “coping skills (i.e., expressing anger appropriately); work habits (i.e., using class time efficiently);
and peer relationships (i.e., interacting appropriately with a variety of children on a regular basis)” (p. 88).

In the literature reviewed, only seven studies were found that examined the use of social storiesTM with individuals who had been identified as having disabilities other than autism. Of these seven studies, one of the studies (Staley, 2001) included participants with a diagnosis of autism. The other participants in the study however, had one or more additional disabilities, such as learning disorders or intellectual disability. Moore (2004) worked with a student who had a learning disability but was also identified as having autism spectrum disorder. Finally, one study (Soenksen & Alper, 2006) used social storiesTM with a student they labeled as having hyperlexia, but received special education services under the category of autism spectrum disorder. Because these studies involved students who were identified as having other disabilities in addition to autism they were included in the following summary.

Staley (2001) used social storiesTM with five male students who were educated in a self-contained special education classroom. Two of the participants were identified as having Down syndrome, one had a pervasive developmental disorder, one had autism, and one was diagnosed as having Fragile X syndrome. The goal was to improve the eating behaviors of the five participants. Specifically, the goal was to teach the participants to use a napkin and to chew food with a closed mouth. The results of this study found that the social storyTM alone was not effective for getting the participants to change their eating behaviors. When the social storyTM was combined with the use of a primary reinforcer (e.g., cereal or potato chips) there was an immediate positive change in behavior. In this case, social storiesTM were not shown to be effective for individuals with disabilities other than autism nor were they effective for participants who were on the autism spectrum.

Moore (2004) used a social storyTM with a 4-year-old boy with a learning disability, autism spectrum disorder, and receptive speech and language delays. The participant in this case study had difficulty with his bedtime routine. The boy pleaded to sleep with his mother, would wake in the middle of the night to demand milk, and would throw a tantrum if his demands were not met. A story was written to teach the young boy a new bedtime routine. Additionally, it reminded him of the rewards he could earn if he followed the new routine without throwing a tantrum. Moore concluded the intervention as a whole appeared to be effective at changing the participant’s sleep routine. However, the impact of the social storyTM on the behavior is unclear due to lack of concrete data and the use of other reinforcers as part of the intervention.

Toplis and Hadwin (2006) used a social storyTM to address the lunchtime behavior of five students who were identified as having challenging behavior within a school setting. Three boys and two girls with an average age of 7 years 5 months participated in the study. The researchers used an ABAB design to evaluate the effectiveness of a social storyTM on the target behavior of independently walking to the school dining area and sitting within two minutes of being dismissed from class. The stories in this study followed Gray’s (1995) basic sentence ratio. Toplis and Hadwin found the social storyTM intervention to be effective for three of the five children who participated in the study. Two of the children continued to require prompts to enter the dining room and sit as directed.

Soenksen and Alper (2006) used a multiple baseline design across settings to evaluate the effectiveness of a social storyTM to teach a 5-year-old boy identified as having hyperlexia, who was served under the category of autism spectrum disorders, to appropriately gain the attention of his peers. The intervention was a combination of written and verbal cues embedded into a social storyTM which was written to follow Gray’s (1995) guidelines. The target behavior was defined as verbally saying a peer’s name and/or looking at a peer’s face while talking to him or her. Results of the study indicated an increase in frequency with which the student would appropriately gain a peer’s attention across multiple settings (e.g., recess, choice time, and math). The appropriate behavior was maintained 49 days after the intervention and maintenance phases ended.

Bucholz, Brady, Duffy, Scott, and Kontosh (2008) used social storiesTM and literacy-based behavioral interventions (LBBI) with three adults with cognitive disability in the workplace environment. Bucholz and colleagues used the term LBBI for the stories that were
used in the study that did not follow Gray’s (1995) guidelines in regard to sentence type or ratio and therefore were not technically social stories™. One participant was a 57-year-old male with Down syndrome and an IQ of 30 who worked in a job training facility. The second two participants worked at the same sheltered workshop. The second participant was a 48-year-old female who had severe intellectual disability. The third participant was a 26-year-old female with severe intellectual disability. The goal of their research was to determine if social stories™ and LBBI were an effective strategy for individuals with intellectual disability in a work environment. The target behaviors included returning to work on time from break and asking for more work or assistance when necessary. The authors concluded that the social stories™ and LBBI were effective at changing the target behaviors for individuals with intellectual disability. Additionally, the change in behavior was maintained for the two female participants who worked at the same sheltered workshop setting.

Kalyva and Agaliotis (2009) used a group design to evaluate the effectiveness of a recorded social story™ intervention for teaching students with learning disabilities to successfully resolve interpersonal conflicts. Sixty-three children with a mean age of 10 years 7 months participated in this study. Forty-one of the participants were male and 22 were females. The students were randomly assigned to the experimental group or the control group. The experimental group consisted of 19 boys and 12 girls while the control group consisted of 22 boys and 10 girls. The researchers read one of three different stories to the experimental group at each phase of the study. The stories were written to describe an interpersonal conflict and participants were asked what strategies they might use to handle the situation. The teachers of the participants were asked to complete the Matson Evaluation of Social Skills with Youngsters Teacher Form in order to gain information about each child’s appropriate and inappropriate social behaviors. Results of this study found that the social stories™ were effective for helping the students in the experimental group use more positive conflict resolution strategies when compared to the control group. Furthermore, the students in the experimental group continued to use more appropriate strategies two months after the intervention was ended while the control group continued to select less appropriate strategies.

Schneider and Goldstein (2009) conducted one study not involving students with autism. Their research included three male participants in grades first through third. Each of the participants were diagnosed with language impairments, had impaired verbal and social communication, but could communicate verbally. These students displayed problem behaviors in the classroom which included aggression, noncompliance and impulse control. The students received speech and language therapy, but they did not receive services to address their problem behaviors. The primary target behavior addressed in this study was appropriately participating in the target activity which included following directions, completing work, making eye contact, and raising a hand. A multiple baseline design across participants was used to determine the effectiveness of the story intervention. Schneider and Goldstein concluded that the social story™ intervention was effective in increasing on-task behaviors for children with language impairments although the change in behavior did vary for each student. Positive changes were maintained after intervention ceased and the students generalized the on-task behavior to different activities and situations throughout the day.

Almost all of these seven research studies concluded that social stories™ were an effective strategy to be used with participants with a variety of disabilities, not only those with autism spectrum disorders. This research indicates that social stories™ or LLBI may not need to be restricted to students with autism to be effective. Based on the limited research available studying the use of social stories™ with participants with disabilities other than autism, the need for additional research is warranted (Bucholz et al., 2008; Reynhout & Carter, 2006).

Gray (1995) recommends for social stories™ to be specific to one individual participant, however, if more than one student has the same or similar social difficulties, it could be beneficial for educators to develop one story or LBBI that could be used by multiple children at the same time. Various strategies such as modeling, role-playing (Stickel, 1990), video modeling (Graetz, Mastropieri, & Scruggs, 2006), social skills
games (Williams White, Keonig, & Scahill, 2007), and social skills classes (Roy, 1993) have been successfully implemented to increase social skills in a group setting. The literature reviewed revealed only one research study (Kalyva & Agaliotis, 2009) that explored the use of a social story™ or a LBBI with more than one individual at the same time.

The first purpose of this study was to determine if LBBI are an effective intervention strategy when used with students with intellectual disability. A second purpose of this study was to determine if a LBBI is an effective intervention strategy when used simultaneously with a group of students targeting the same or similar social situation or behavior. In this study the term LBBI is used because the stories do not follow Gray’s (1998) specific guidelines as they were not individually written for only participant at one time.

Method

Participants and Setting

Five middle school students participated in this study. All students attended a self-contained classroom for all academic subjects. All students in this class have been identified as having mild/moderate intellectual disability. Students attended connections classes (art, PE, home economics, etc.) in a general education setting with paraprofessional support. Students were placed in two groups. One group consisted of two students and the second group contained three students. The students in these groups exhibited similar behaviors to be targeted with the LBBI.

Group A included two students who “called out” during class. Carol was a 14-year-old, female in the eighth grade. Her cognitive level was in the mild intellectual disability range as determined by the school psychologist. Carol read on a fourth grade level, while her reading comprehension skills were at a second grade level. Brittany’s math skills were at a third grade level. Brittany received occupational therapy for 45 minutes per month.

Group B consisted of three participants who exhibited “off task” behaviors. Bryan was a 16-year-old male in the eighth grade. His cognitive level was in the moderate intellectual disability range as determined by the school psychologist. This student was nonverbal and used an augmentative and alternative communication (AAC) device for communication. He also received 45 minutes of speech services each week. Although he had an AAC device, he rarely used it, preferring to point and make unintelligible verbalizations. Bryan was working on matching letters and numbers, counting objects, and matching functional symbols and signs. Connor, the second member of Group B, was a 12-year-old male in the sixth grade. His cognitive level was in the moderate intellectual disability range as determined by the school psychologist. He also received 45 minutes of speech services each week. Connor read at a primer level and his math skills were at a first grade level. Zeke, the third member of Group B, was a 12-year-old male in the sixth grade. His cognitive level was in the mild intellectual disability range as determined by the school psychologist. Zeke read at a third to fourth grade level. His reading comprehension and math skills were at a third grade level.

Behavioral Measures

The stories written for these students followed Gray’s (1998) guidelines for sentence type and ratio. However, these stories differed from Gray’s guidelines because they were not individualized for one specific student; rather they covered a few examples of the targeted behavior in more generalized terms for a small group of students. Therefore, the interventions in this study are referred to as LBBI and not social stories™. Stories were individualized in that they stated the name of the school, the names of the classroom teachers, and targeted only one specific behavior. The reading and comprehension level was kept at a basic level in order for the students in the group to understand the story. A mixture of real pictures and drawings were used in each story. The classroom teacher or classroom paraprofessional read the LBBI to the target group once per day in the morning prior to the time period where data were to be col-
lected. Stories were read in a quiet location away from the other students.

Behaviors targeted in this research study were blurt out behaviors and off-task behaviors. Blurt out behaviors were defined as talking without being called on by the teacher or paraprofessional, talking when the teacher or paraprofessional was talking or instructing, or talking while another student was speaking. Off-task was defined as not being engaged in the assignment, playing with objects during instruction, and/or staring at the desk or looking around the room during work time. The independent variable in this study was the use of a literacy-based behavioral intervention.

**Experimental Design**

A multiple baseline across groups research design was used to evaluate the effectiveness of a literacy-based behavioral intervention written for a small group of students. Two separate groups of participants targeting different behaviors were studied. The target behavior for Group A was blurt out. The target behavior for Group B was being on-task during assigned work times. Baseline data were collected on both groups before the group LBBI was initially implemented with either group. The data collection method utilized for both groups was a whole interval recording method. The interval period was 10 s for observation with 5 s allowed for recording data for a 15 minute observation period each day. Data were collected three days per week on Monday, Wednesday, and Friday. In the event of a school holiday or closure, the data were collected the following day to maintain consistency in data collection.

The first group LBBI was presented to Group A in the special education classroom. Data were collected three times per week by the researcher and paraprofessional on the effectiveness of the LBBI on each individual student’s behaviors in the group. Once a positive change was observed with the participants in Group A, the second LBBI was presented to Group B in the special education classroom and data were collected on the associated behaviors for the individual students. The LBBI continued to be read to Group A and data were still collected on Group A participants’ behaviors.

Two weeks after Group A’s intervention phase ended and one week after Group B’s intervention phase ended, maintenance data were collected to determine if the appropriate behaviors for each participant had increased or decreased with the removal of the LBBI. Additionally, generalization data were collected by the researcher and paraprofessional in settings other than the special education classroom, such as the cafeteria, art, and during physical education.

**Interobserver Agreement**

The paraprofessional in the mild/moderate intellectual disability (MI/MO) classroom was trained to collect data along with the classroom teacher in order to provide interobserver agreement for the study. The classroom teacher/researcher instructed the paraprofessional on the targeted behaviors, data collection procedures, and interval recording procedures. The paraprofessional was required to record a positive mark if a behavior was exhibited at any time during the interval. The classroom teacher and paraprofessional practiced several times prior to collecting baseline data to maintain accuracy and consistency among raters. In addition, interobserver agreement data continued to be collected throughout the research study. Data were collected one day per week by both the classroom teacher and paraprofessional during the same 15 minute time frame to assess interobserver agreement for the study.

Interobserver agreement data were collected once per week for 9 weeks, representing 33% of the observations. Interobserver agreement was calculated by totaling the number of intervals which both observers recorded each targeted behavior, dividing that total by disagreements plus agreements, and multiplying that result by 100 to arrive at a percentage (Kennedy, 2005). For Brittany, the average interobserver agreement was 99.33%, with a range of 96%–100%. For Carol, the average interobserver agreement was 100%. For Zeke, the average interobserver agreement was 100%. For Connor, the average interobserver agreement was 100%. For Bryan, the average interobserver agreement was 99.33% with a range of 96%–100%.
Results

Figure 1 depicts the rate of behavior for the five participants. All five participants (both groups A and B) demonstrated a reduction in their respective disruptive behaviors after the LBBI was introduced, although the level of improvement varied for all five participants. The average daily percentages were calculated...
by determining the number of intervals the target behavior was observed during each data collection period divided by the total number of intervals and multiplying by 100. The total average for each phase of the study was calculated by totaling the data collection period averages over one particular phase (baseline, intervention, maintenance, or generalization phase) and dividing by the number of collections within the phase. For Brittany, blurting out was observed on average of 39.2% of the intervals (range 23%–52%) during the baseline phase. Throughout the intervention phase of the study, blurting out behaviors decreased to an average of 17% of the intervals (range 10–30%). This is an average decrease of 22.2%. For Carol, blurting out was observed on average of 18.3% of the intervals (range 18%–25%) during the baseline phase. Throughout the intervention phase of the study, blurting out was observed on average of 11.4% of the intervals (range 5–16%), an average decrease of 6.9%.

The LBBI also improved the behaviors for the students in the second group, group B. For Zeke, off-task behaviors were observed an average of 58.6% of the intervals (range 55%–63%) during the baseline phase. Throughout the intervention phase of the study, off-task behaviors were observed an average of 35% of the intervals (range 27–50%), a decrease of 23.6%. For Connor, off-task behaviors were observed an average of 45.7% of the intervals (range 42%–50%) during the baseline phase. Throughout the intervention phase of the study, off-task behaviors were observed an average 23% of the intervals (range 13–45%). Connor’s behavior decreased an average of 22.7% during the intervention phase. For Bryan, off-task behaviors occurred during an average of 83% of the intervals (range 78%–87%) during baseline. Throughout the intervention phase of the study, off-task behaviors were observed during an average of 55% of the intervals (range 47–67%), a decrease of 28%.

**Maintenance**

Maintenance data were collected two weeks after the intervention phase ended for Group A and one week after the intervention phase ended for Group B. Maintenance data were collected on a Monday, Wednesday, and Friday. For Brittany, blurting out behaviors were observed during an average of 10% of the intervals (range 10–12%). This average is 7% less than her average during the intervention data collection period. For Carol, blurting out behaviors were observed during an average of 5% of the intervals (no range). This average is 6.4% less than her average (11.4%) during the intervention period. For Zeke, off-task behaviors were observed during an average of 28% of the intervals (range 27–30%). This average is 7% less than his average during the intervention observation period. For Connor, off-task behaviors were observed during an average of 14% of the intervals (range 13–16%). This average is 9% less than his average during the intervention observational period. For Bryan, off-task behaviors were observed during an average of 47% of the intervals (no range). This is 8% less than the average rate of behavior observed during the intervention observation period.

**Generalization**

Generalization data were collected once a day for 4 days during connection classes by the special education classroom teacher. The generalization results were consistent with the intervention data for each student. For Brittany, blurting out behaviors ranged from 10%–23% of the generalization observation intervals (average of 16.2%). Her rate ranged from 10% to 30% during the intervention phase. For Carol, blurting out behaviors ranged from 5%–16% during the intervention observation period. For Connor, blurting out behaviors ranged from 5%–13% of the generalization observation intervals (average of 9.4%). Carol’s rate of behavior ranged from 5%–16% during the intervention phase. For Zeke, off-task behaviors ranged from 27%–50% of generalization observational intervals (average of 36.5%). During the intervention phase his behavior also ranged from 27%–50% of the intervals. For Connor, off-task behaviors ranged from 13%–33% of generalization observational intervals (average of 21.5%). During the intervention phase off-task behavior were observed from a low of 13% to a high of 45% of the observational intervals. For Bryan, off-task behaviors during generalization observations ranged from 47%–63% of intervals (average of 56.66%). This is similar to his rate during
the intervention phase when his off-task behavior ranged from 47% to 67% of the observation intervals. Bryan was absent for one of the four generalization data collection dates.

Discussion

The purpose of this study was to examine the effects of LBBI on the behaviors of small groups of students with intellectual disability. While these stories used the sentence types suggested by Gray (1995) they are not true social stories™ because they were not individually written for only one participant. Research has indicated that social stories™ or LBBI are useful for teaching new routines (Moore, 2004), addressing work related behavior (Bucholz et al., 2008), or teaching conflict resolution skills (Kalyva & Agaliotis, 2009).

In this study LBBI led to all participants demonstrating a reduction in their target behaviors. The greatest reduction of target behavior occurred for Brittany as she decreased her calling out from an average of 39.2% to 18.7%. Brittany’s target behaviors continued to decrease even after the intervention phase ended (maintenance phase–average 10%). Also, the target behaviors continued to decrease in her connections classes throughout the study (generalization data–average 16.2%). Bryan’s target behavior, being off task, reduced from a high of 83% to 60%. After the intervention phase ended, Bryan continued to decrease his target behaviors (maintenance phase–average 47%). In addition, he continued to decrease the instances of the target behavior during his connections classes (generalization data–average 56.7%).

It is believed that his results would have been reduced even further if he did not have frequent absences. Bryan was absent for 13 out of 20 data collection dates during the baseline phase, two out of eight data collection dates during the intervention phase. Bryan was absent a total of 17 out of 36 data collection dates for the entire research study (47%).

While the research on social stories™ has focused on students with autism, this study was conducted to expand the research on this type of intervention, specifically literacy-based behavioral interventions, to middle school students with mild/moderate intellectual disability. The stories were written to follow the sentence type guidelines suggested by Gray (1998), but they differ in that they are written to target more than one student at a time. One impact of these students’ intellectual disability was a lower level of comprehension and difficulty in retaining information that is read or heard. One recommendation would be to include comprehension questions after the story is read to ensure the participants’ understanding of the story.

The positive outcomes of this research are especially important due to the lack of research that has been done on LBBI and social stories™ with students who have disabilities other than autism. These results indicate that using LBBI with students with intellectual disability can result in positive changes in behavior. Additionally, these positive outcomes are important because it is the first research study that utilized only one LBBI with a group of students targeting one behavior, the one other group study (Kalyva & Agaliotis, 2009) used three different stories to target social skill behaviors. Because of the relative ease to develop and implement the story strategy, the results of this research can expand the type of behaviors that can be positively impacted by using LBBI.

As this is the only one of two research studies that has targeted a group of students, additional research is needed to validate the effectiveness of using LBBI with small groups of students. Additional research is also needed to study the effectiveness of using LBBI with students having disabilities other than autism.

Limitations

A limitation to this study is that all students are in the same classroom for all academic classes. It is unknown if results would have been different had the students been in different classrooms with different teachers. An attempt to remedy this limitation was to utilize the para-professional in reading the stories in a small, separate location.

Another limitation was the length of the intervention phase. The target behaviors may have continued to decrease if the intervention phase had continued. Also, the length of time between the intervention phase and the maintenance phase could have been longer to ensure that the behaviors had continued to decrease.
with the removal of the intervention and continued to be maintained at a lower rate.

The present study investigated whether LBBI would improve the behaviors for five students with intellectual disability. The results are encouraging and provide empirical support for the use of LBBI for individuals with intellectual disability. However, additional research is needed to further evaluate the effectiveness for LBBI for individuals with various types of disabilities.

References


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