

**THE EFFECT OF POWERPOINT RELATIONSHIP NARRATIVES ON THE
BEHAVIOR OF STUDENTS WITH AUTISM**

by

Carly Howe

An executive position paper submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Education in Educational Leadership

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BEHAVIOR OF STUDENTS WITH AUTISM**

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ABSTRACT

Autism Spectrum Disorder (ASD) is a complex brain based disorder. Children are being diagnosed with ASD at an alarming rate. Students with ASD present with behaviors that interfere with their learning and the learning of others. These behaviors can be a challenge for the teachers and other staff who work with students with ASD. For the past 25 years, teachers have used Social Stories as an intervention for challenging behaviors. A Social Story is an explicitly written step-by-step description of a situation, concept, or skill. It is written with the target student as the main character and explains to them how to navigate a particular social situation that is challenging for them. It also gives the reasons why the student should follow the steps in executing the skill. This study addresses two problems that teachers and other staff have found when using Social Stories with their students with ASD: student engagement and the ability to read. This study focuses on digital Social Stories, specifically PowerPoint Relationship Narratives (PPRN) as an intervention for students with ASD. Two fifth grade students with ASD interacted with PPRNs that were tailored to fit their particular behavioral needs. The pattern of results from the study show a functional relationship between the intervention and the change in problem behaviors. Student W showed a mean improvement in reducing his delaying the start of work behavior by 75% from the Baseline phase to Intervention Phase 1. Student R showed a mean improvement in reducing her time in the bathroom behavior by 41% from the Baseline phase to Intervention Phase 1. Limitations of the study include small sample size and a short time frame. Based on results obtained from this

study, PPRNs are a promising intervention for students with ASD. Feedback from staff who worked with the students was positive. Additionally, a professional development workshop on how to write PPRNs was made to 10 staff who work with students with ASD. The feedback from the workshop was positive. Based on these results, recommendations are made to the Brennen School administrators that include providing opportunities and time for staff to learn how to design, develop, and use PPRNs.

Chapter 1

INTRODUCTION AND PROFESSIONAL LITERATURE

Local Problem

Many students with ASD exhibit behaviors that interfere with their learning and the learning of their classmates. ASD is characterized by difficulties with behavior, communication, social interactions, and sensory processing. These characteristics are common among most people with ASD and vary in degree. Social Stories (Gray, 1993) have a developing base of research that shows they can be an effective intervention for teaching prosocial behaviors to students with ASD (Ozdemir, 2008, Barry & Burlew, 2004, Rogers & Miles, 2001). Additionally, Social Stories are one of the most frequently used interventions for children with autism (Chan, 2011; Stahmer, Collings, & Palinkas, 2005). As a teacher for the Brennen School in the Delaware Autism Program, I have found two problems with using Social Stories with some students with ASD.

One problem in implementing a Social Stories intervention for some students with ASD is that the student needs to read the Social Story or, if that is not feasible, the Social Story needs to be read to him or her. When a student cannot read, having someone available multiple times a day to read the Social Story can be difficult to achieve in a busy classroom with limited resources.

Another challenge in implementing Social Stories is that the student needs to attend to the Social Story and be engaged with it in order to benefit from it. Attention to materials is a prevalent problem when teaching students with ASD. In their review,

Ames and Fletcher-Watson (2009) stated that “atypical attention, while not a diagnostic feature, is common in individuals with autism spectrum disorders (ASD)” (p.56). I have found that students in my classroom, in general, are becoming more used to and intrigued by information presented digitally. I also have found that digital material can capture my students’ attention and cooperation more readily than typical print formats.

The local problem to be addressed in this EPP is: How can Brennen School teachers minimize the barriers of reading and low engagement when using Social Stories as an intervention for teaching prosocial behaviors to their students with ASD? The Brennen School is a school that serves only students with ASD ages 1 to 21 years old. It is part of the statewide Delaware Autism Program. The Brennen School has satellite classes in pre-schools, and elementary, middle, and high schools throughout New Castle County, Delaware and employs over 85 special education teachers. It serves over 400 students with ASD in New Castle County.

The purpose of this Executive Position Paper (EPP) is to investigate a recently developed technique, called a PowerPoint Relationship Narrative (PPRN), as a behavioral intervention strategy for teaching prosocial behaviors to school-age children with ASD who have not yet developed sufficient reading comprehension skills and/or the attentional focus to benefit from interventions such as Social Stories. The structure of a PPRN appears to provide a creative approach to tailoring a Social Story intervention to the specific learning needs and preferences of many children with ASD. The success of PPRNs, however, has been reported only in the form of anecdotal clinical cases. This EPP attempts to begin the creation of an evidence base for this approach by collecting pilot data on its effectiveness within the structure of a

multiple-baseline single-subject research design (Barlow, Nock, & Hersen, 2008; Kazdin, 2011; O’Neill, McDonnell, Billingsley, & Jenson, 2011; Richards, 2017; Riley-Tillman & Burns, 2009; Tawney & Gast, 1984). I begin this exploration with a review of the professional literature on the ways in which applications of Social Stories and technology affect the behavior of students with ASD and an analysis of how this information can inform the design of specific PPRNs for individual students.

The key questions to be examined in this EPP are:

Key Question #1: Are PPRNs effective in teaching desirable classroom behaviors and social skills to children with ASD? If so, how quickly and to what degree?

Key Question #2: How should an educator tailor the design of PPRNs to students with ASD who have different strengths, needs, and learning preferences?

Key Question #3: What are the perceptions of staff who work with students with ASD about the use of PPRNs with students in their classrooms?

Key Question #4: What professional development training should be provided to teachers of students with ASD to empower them to effectively design and use PPRNs with their students? (Answering this question is dependent upon obtaining positive answers to Key Question #1.)

Professional Literature

Many students with ASD exhibit behaviors that limit their ability to interact effectively and develop friendships. Because there is not one single strategy that works for all students with ASD, professionals who work with students with ASD are looking for a larger repertoire of evidence-based strategies. Professionals want effective strategies that help reduce these problem behaviors and promote social skills.

Because students with ASD also have specific learning preferences and strengths, it is important that the intervention strategies can be tailored to these preferences and strengths.

In this section, I describe the nature of Social Stories and explain their effectiveness as an intervention. The reason for reviewing Social Stories is that they bear a close resemblance to PPRNs. This will be explained below. Of particular interest for my EPP are Social Stories that are technologized i.e., that are presented on a computer or hand held device.

What Is a Social Story and What Is Known About Their Effectiveness?

Social Stories were first introduced by Carol Gray in an article in *The Morning News*, a newspaper from the Life Skills Institute in the Jenison Public Schools in Missouri in 1990. Since that time, Social Stories have become a very popular and purportedly effective intervention for social skills with teachers of students with ASD (Reyhout & Carter, 2009; Styles, 2011).

According to Gray (2010), a Social Story is a visual learning tool that describes a concept, skill, or situation. A Social Story is visual in the sense of being a written description of a social situation, rather than verbal directions. It can include illustrations as well. According to Grey (1993), the Social Story can be presented to a student in three different ways. If the student can read, the child can read it to the teacher. If the child cannot read, the story can be presented to the student via an audio recording. Lastly, a strategy that can be used with any student is having the story read to the child on a video. With this strategy, the video plays the audio of the person reading the story while the printed words are displayed on the screen.

According to Gray (2014), there is one major type of sentence and three optional sentences types used in a Social Story. Descriptive sentences are the main component of a Social Story narrative. The optional types of sentences are directive, coaching, and perspective. A descriptive sentence tells what people do in a social situation and why. A directive sentence gives information about responses that are expected of the student. A perspective sentence gives information about others' reactions to the situation in the Story. A coaching sentence describes the positive outcome that occurs when the student follows the directions given in the Social Story.

In designing a Social Story, a teacher is supposed to choose from among the different sentence types according to the child's needs. The short, 5-10 sentence personalized story format of a Social Story puts the concept, skill, or situation in a supportive and patient frame for the child. This allows the child to learn about it in a descriptive, meaningful, and emotionally safe way. It is written in first person. An example of a Social Story follows:

How to Greet People at School

There are lots of ways to greet people I see at school.

I will try to smile and say "hi" or "hello" when I see someone I know at school. They might say "hello" or "hi" to me. I can also ask someone "How are you?"

In the morning, I will try to say "good morning!" to people I see. At dismissal, I will try to say "good-bye".

If I am passing someone I know in the hall, I can smile or wave. People like it when I smile at them. Smiling makes people feel good.

When I say “hi” or “good-bye” to someone, it makes them happy.

Gray and Garand (1993) explained the logic of using Social Stories, which is based on the concept of social cognition. Social cognition focuses on the skills required during social interactions, which include both verbal and non-verbal communication. These types of communication skills can involve gestures, body language, and facial expressions. The authors describe how teaching social behavior through Social Stories builds these cognitive skills in children with ASD. Social Stories describe what students with ASD perceive as confusing social situations in a direct way that helps the students with ASD navigate them. These characteristics also are true of PPRNs.

Numerous articles in professional education journals have discussed the effectiveness of Social Stories. Ali and Frederickson (2006) conducted a review of research studies on Social Stories that were undertaken between 1994 and 2004. The reviewed studies consisted of both those that employed single participant research designs and multiple participant research designs. Ali and Frederickson discussed limitations found within the studies. One limitation was that some of the single participant studies produced only modest change in the target behaviors. Another limitation was that in some studies the Social Stories were paired with other interventions (visual aids, token systems, prompting by staff, photos, computer-based formats, video feedback, and verbal corrective feedback), so that it was difficult to determine the unique contribution of the Social Stories to the skill acquisition. Additionally, most of the evidence base was obtained via single-participant research designs, which have low external validity. The authors concluded that, because of these limitations, the research reviewed suggests only a positive potential of Social

Stories for promoting skill growth in students with ASD. The authors recommend continued research to find out how to make Social Stories more effective for individual students.

Bozkurt and Vuran (2014) conducted a review of 22 Social Stories investigations and found similar limitations as Ali and Frederickson (2006). Because of those limitations, Bozkurt and Vuran concluded that Social Stories have uncertain effectiveness as an intervention for students with ASD. They considered the effectiveness uncertain because 72.72% of the studies that were reviewed paired Social Stories with other interventions. Additional interventions included video models, photographs, visual supports, Social Stories presented in computer format, verbal prompting, reinforcement, music, and physical prompts. They found that Social Stories were more effective when combined with these additional interventions. Bozkurt and Vuran reported a 13.63% mean for the Percentage of Non-overlapping Data (PND) for Social Stories presented alone and a 36.36% mean PND for Social Stories with an additional intervention. As a consequence, Bozkurt and Vuran concluded that because “The use of Social Stories has been popularized, widely discussed and recommended in the literature” (p. 1877), Social Stories should be considered a promising intervention. Bozkurt and Vuran also recommend continued research on Social Stories to find out how to make them more effective.

Methodological problems in research on Social Stories also have been noted in a variety of other literature reviews (Reynhout & Carter, 2011; Styles, 2011). Overall, reviewers found that most of the studies involving Social Stories had limitations. The general feeling is that Social Stories are beneficial, but it is hard to confirm this because most of the studies included additional interventions along with the Social

Stories. As a consequence, reviewers unanimously stressed the value of further research on the design and use of Social Stories.

Why Have Some Educators “Technologized” Social Stories and What Is Known About Its Effects?

Because all PPRNs use technology as a delivery platform, in this section, I review studies that combined Social Stories with technology in interventions for children with ASD. Many studies conducted in recent years specifically examined the use of Social Stories presented in a multimedia format.

Technology may offer specific advantages in addressing the core deficits of people with ASD (Grynszpan, 2014). Recent studies have offered different reasons for the distinct interest that people with ASD seem to have in electronic learning (Bernard-Opitz, 2001). The main reason may be that most people with ASD respond well to visual stimuli. In their study of vocabulary acquisition by children with ASD, Moore and Calvert (2000) found that the use of computers produced increased attention, vocabulary acquisition, and desire to continue the lesson over traditional one-on-one non-computer-based instruction. Moore and Calvert (2000) posited that technology focuses their attention because of the intrinsically interesting learning environment that a computer provides (including visual action and sound effects).

Hagiwara and Myles (1999) used a multiple-baseline-across-environments single participant design to study the effects of Social Stories in a multimedia format on the hand washing and on-task behavior of three students with autism. A story was presented in a book-like format on a computer screen with a computer-generated voiceover. Students clicked on a screen “page” to advance to the next page. The results showed that, overall, the intervention using the multimedia format was

effective. The authors especially noted that the acquired skills generalized across environments.

Mancil, Haydon, and Whitby (2009) looked at the effectiveness of Social Stories with and without a PowerPoint format using a multi-component reversal single participant design. The study targeted pushing behavior of three elementary age students with ASD. The non-technology Social Story followed Carol Gray's recommended format. The PowerPoint Social Story followed the same format, but was interactive: its text was presented in color and, when the spacebar was pushed, the text color slowly changed to cue the student to move to the next slide. Both formats included pictures of peers performing appropriate behaviors instead of pushing. The three students viewed the PowerPoint Social Story on a computer each day at the back of the classroom; they read the non-technology Social Story each day at their desks at the end of the class Reading lesson.

Mancil et al. (2009) found an overall reduction in the pushing behavior from baseline phase to intervention phase for all participants. The results were slightly better for the PowerPoint-presented Social Story than the paper Social Story. Additionally, the researchers asked the children with ASD which presentation format they preferred. All three chose the PowerPoint format and chose to continue its use voluntarily during a two-week interval between the intervention phase and the maintenance phase. The study also found, through a social validity scale, that their teachers preferred the computer-assisted format of the Social Stories. The main reason the teachers preferred the computer-assisted format was that the students seemed to "enjoy the story more in PowerPoint presentation" (p. 212).

Mancil et al. (2009) attributed the students' preference to the high interest in computers of children with and without ASD. They also discussed the color changing technique for cuing the students as both providing support to attend and appealing to the students' visual strengths. The findings that (a) the students preferred and then voluntarily chose to continue watching the PowerPoint Social Story, (b) the teachers preferred the PowerPoint Social Story, and (c) the PowerPoint Social Story resulted in positive outcomes attest to the social validity of this intervention.

What Is a PPRN and Why Might They Represent an Innovative Variation of Technologized Social Stories?

Because students with autism appear to have an affinity for computers and are visual learners, it is relevant and applicable to investigate PPRNs. PPRNs may represent an innovative variation of technologized Social Stories. Dr. Laura Riffel is the creator of PPRNs. Riffel's website, *The Behavior Doctor*, introduces Riffel as a teacher and author of practitioner-oriented books who presents seminars for educators, other professionals, and family members across the country on a wide range of topics in the positive behavior support topical area. The strategies and interventions that she coaches are aimed at helping students with autism, ADHD, learning disabilities, and oppositional defiance disorder to manage their behavior. One of the strategies that Riffel presents in her books, at her seminars, and on her website is PPRNs.

A PPRN is a form of technologized Social Story. In her online book, *Three Tiered Support in Your Classroom* (2013), Riffel reported that she has had success with PPRNs throughout her career. She introduced them in the following way: "The best interventions for autism and Asperger syndrome in the classroom are video modeling or video self-modeling. This can be done with PowerPoint stories or with

video...” (p. 36). She went on to say that PPRNs can be used to teach social skills, routines, and replacement behaviors for targeted problem behaviors, and help with transitions. In this book and on her website, Riffel provides general design guidelines for PPRNs, along with some examples.

Although Riffel presents PPRNs in her training seminars, books, and online literature, there is no published professional or scholarly literature about their design components, use, or effectiveness. However, as discussed above, several research studies have been published about computer-assisted Social Stories as interventions, which bear similarities to Riffel’s conception of PPRNs. Because of the instructional potential afforded by the combination of their creative features, their use of a technology platform, and their similarities to Social Stories, this EPP explores the design and use of PPRNs as an intervention for social behaviors of students with ASD in the Brennen School program.

Chapter 2

METHODS AND FINDINGS

Participants

Two elementary age students with ASD from the Brennen School program housed at Maclary Elementary School participated in this study. They possessed the demographic characteristics presented in Table 1 below.

Table 1 Demographics of the Participants

<u>Name</u>	<u>Age (yrs)</u>	<u>Diagnosis</u>	<u>SES</u>	<u>Race</u>	<u>Gender</u>	<u>Academics</u>	<u>Target Behavior</u>
R	11.3	Autism, Down Syndrome	Paid lunch	Caucasian	female	Reading - 2nd grade level Math - 1st grade level Non-verbal IQ = 50	Off task behavior- Staying in the bathroom too long
W	10.9	Autism	Reduced lunch	Caucasian	male	Reading - 2nd grade level Math - 1st grade level Non-verbal IQ = 84	Off task behavior- Delaying the start of work

Setting

Both students attended a regular elementary school and were in the 5th grade. R and W were in a self-contained Brennen School program class with three other students with ASD. Their physical classroom was comprised of two different classes

of fifth graders divided by a movable, physical divider. Each class had its own teacher and paraprofessional. The four staff members interacted with all the students in the classroom. The staff possessed the demographic characteristics as described in Table 2 below.

Table 2 Demographics of Staff

Name	Position	Gender	Race	Years of Experience
C	teacher	female	Caucasian	19
L	teacher	female	Caucasian	5
K	para	female	Caucasian	8
M	para	female	Caucasian	5

Defined Target Behaviors

All of the target behaviors that were addressed consisted of actions that cause the students to be off task: staying in the bathroom too long and delaying the start of work. These behaviors are operationally defined below.

Staying in the bathroom too long was defined as being located inside the bathroom longer than five minutes. Once the student entered the bathroom, she tended to engage in verbal self-stimulation by reciting video scripts out loud and was reluctant to leave the bathroom. It was chosen as a target behavior because the student loses instructional time. Additionally, when the student moves to middle school, she will be using a bathroom with stalls. This behavior will keep a bathroom stall

occupied for long periods of time, making other students wait for the bathroom and causing a staff person to leave the classroom to stay with this student.

Delaying the start of work is defined as engaging in any activity other than the morning work activity for longer than three minutes. This was measured from the time the student entered the room to the time he sat at the table and turned on his iPad or picked up a writing instrument to beginning writing. Delaying was chosen as a target behavior because this student implemented a variety of tactics to delay his start of work, such as crying, sleeping, playing with a toy, refusing, and escaping, which caused substantial losses in instructional time. Additionally, starting work promptly is a valuable skill for his future school and work life.

Procedures

The procedures that I implemented in this study were embedded in the following five major stages:

1. Design and create a PPRN for each target behavior and participant following the general guidelines by Riffel (2013), with some of Carol Gray's (2014) guidelines added,
2. Implement baseline and intervention data collection phases with the target participants, in accordance with the prescriptions of the research design,
3. Collect data from the target participants and teachers, and
4. Analyze and interpret the data.
5. Collect collateral data based on findings of the study.

The subsections below explain those 5 stages.

Stage 1 - Design and Create a PPRN

I created PPRNs for the two students, mainly according to the guidelines that Riffel explains on her website. Additionally, I incorporated Gray's Social Stories 10.2 Guidelines (2014) found on her website.

On her website, Riffel explains the process of designing and creating a PPRN. Within this process, I interwove some of Gray's Social Stories 10.2 guidelines. I separated the design and creation process that I used into 4 phases.

Phase 1 started with what Riffel calls a "Storyboard". A Storyboard is a written plan that consists of a brainstorming list of the components of the target behavior. The Phase 1 steps included:

- Identify the target problem behavior.
- Identify what that behavior looks and sounds like.
- Identify when the behavior occurs.
- Identify a replacement behavior. This replacement behavior is the desired substitute for the undesired target behavior.
- Identify what will be different for the student when the new, replacement behavior substitutes for the old, undesirable behavior. This means talking about how the student's daily life will be better when they do the new behavior instead of the old behavior.

This phase also incorporated Gray's guideline #2, called "Two-Step Discovery": the Author gathers information to (1) improve the child's understanding of the audience relative to a situation, skill, or concept and (2) identify the topic and focus of the story.

Phase 2 consisted of gathering relevant visuals or photographs. Photographs were taken of the child performing the undesirable behavior and the desirable behavior over a period of a few days in naturally occurring settings. Relevant photographs or pictures from the internet were also used.

Phase 3 involved creating a script to turn the Storyboard into PPRN slides. The script was written in the first person and followed a formula specified by Riffel. Gray's guideline #5 was incorporated as well. It is called Define Voice and Vocabulary. A Social Story has a patient and supportive tone and employs vocabulary that is described by five factors. These factors are: (1) First- or Third-Person Perspective; (2) Past, Present, and/or Future Tense; (3) Positive and Patient Tone; (4) Literal Accuracy; and (5) Accurate Meaning. The formula from Riffel for writing the story script follows a specific sequence. Below is the formula with examples:

1. A positive opening statement (e.g., "I am Jane. I go to Doe Elementary. I am a cool kid.")
2. A statement of the targeted problem behavior (e.g., "Sometimes I spit on my friends.")
3. A statement of reasons to not do the problem behavior (e.g., "When I spit on my friends, they may not want to play with me.")
4. A statement to introduce the target replacement behavior (e.g., "When I feel like spitting, I should go to the beanbag and take a break.")
5. A "proud" statement (e.g., "My teachers and parents are proud of me when I take a break instead of spitting.")
6. A statement of another alternative replacement behavior (e.g., "When I feel like spitting, I also can squeeze my beanie baby.")
7. Another affirmation statement (e.g., "My friends are so proud of me when I squeeze my beanie baby instead of spitting.")
8. A statement of an intermediate reinforcer (e.g., "When I take a break or squeeze my beanie baby, I can put a sticker on my point card.")
9. A statement of the "big" reinforcer (e.g., "When I have 5 stickers, I can play on the computer for ten minutes.")

10. The closing “Big Proud” statement (e.g., “My teachers, mom, dad, and friends are so proud of me when I take a break on the bean bag and squeeze my beanie baby.”)

In Phase 4, the script and the photographs were put together into a Microsoft PowerPoint presentation of slides. Each statement in the PPRN script was accompanied by a photograph of the student performing or experiencing the actions in the statements. Because specific slide layout guidelines, such as how many actions per slide, how many photos per slide, what font size and type to use, where to position the text and the photos on a slide, etc., were not provided by Riffel, those specific details were left up to the teacher-designer’s discretion. Once the PowerPoint slides were made, voice over was added of the teacher reading the script to match the slides. See Appendix A for a copy of Student W’s PPRN and Appendix B for a copy of Student R’s PPRN.

Stage 2 - Implement Baseline and Intervention Data Collection Phases

Baseline Conditions. After design and construction of the PPRN were completed, formal observational data recording of the two participants’ target behaviors began. A multiple baseline design was utilized. This is explained further in the Research Design sub-section. When performing under the baseline conditions, these students continued their current routines in the classroom. No new intervention started during this time, including the PPRN. The Research Design sub-section also describes the criteria for moving from the baseline to intervention phase of data collection. See the table below for a description of the current baseline routines for staff.

Table 3 **Baseline Description**

Student	Student Behavior	What Staff Does When Behavior Occurs
W	Delaying start of work	Staff verbally reminded him of what he is working for and what he should be doing (sitting at the table).
R	Remaining in the bathroom too long	Staff had R read her bathroom rules (No talking in the bathroom, come out when the timer goes off, earn a treat if the rules are followed) before she entered the bathroom. She was both praised and earned a treat if she beat the timer or was reminded of why she did not get the treat if she did not beat the timer.

Intervention Conditions. Two intervention phases were conducted during this project. For both phases, the target students listened to and watched their respective PPRN three times per day (morning, lunch time, and before they went home) on their iPads. Students had “iPad story” listed on their daily schedules at these times. Students could choose to use headphones or not. If students did not respond to the visual cues on their schedules, their teachers verbally prompted them to get their iPads and start their PPRN at the appropriate times. Viewing a PPRN three times per day is recommended by Riffel, although no specific reason is given in any of her instructions. I followed this guideline because in my experience, when my students with ASD are learning a new skill, repeated exposure and practice, especially when the new skill is introduced, has been a successful strategy. I recorded observational data on each of the student participants each day. This was done by recording duration of the target behavior, comments made by the students during their interaction with the PPRN, and/or my notes of anything unusual about the day and/or student’s behavior on a data sheet.

For both intervention phases, the other teacher and the two classroom paraprofessionals in the classroom also were involved with the implementation of the PPRN intervention. They were available to students to help them with turning on their respective PPRN, help them with adjusting the volume, ask them the comprehension questions (see below), and deliver reinforcers after students watched their PPRNs. During Intervention Phase 1, a student was reinforced immediately with both praise and a chosen edible item each time he/she watched their PPRN. During Intervention Phase 2, a student was reinforced with only praise after engaging with their PPRN. The students were told, “Nice job watching the video.” or “I like the way you remembered to watch your video.” These two intervention conditions were included in this study to examine the potential benefit of tangible reinforcers for reading PPRNs, since some studies of Social Stories did, while others did not, include them as part of their intervention packages.

As a teacher, I almost always use a social reinforcer and a tangible reinforcer while introducing a new skill to one of my students. Additionally, my literature review showed that Social Stories are more effective when combined with other intervention components such as reinforcement. I wanted to look at the effect of the PPRN plus the tangible reinforcer versus the effect of the PPRN plus only a social reinforcer. Intervention 2 did not include a tangible reinforcer for reading a PPRN and, thus, allowed me to see if a tangible reinforcer was necessary to derive benefit from engaging with the PPRN.

During both Intervention phases, a staff member asked a student one question after each viewing of a PPRN to assess a student’s attention and comprehension. The

question was different each time. The questions rotated, in order, among those in the list below. If the student responded correctly, the staff member offered praise.

Comprehension Questions for the Students

1. What does this story tell you is NOT a good behavior in school?
2. What is the “good behavior” the story talks about?
3. Do you like listening to this story?

If the student responded incorrectly, the staff member provided the answer to the question. The staff member then asked the question again and the student was prompted to supply the correct answer.

Table 4 Data Collection

Student	Behavior	Recording System	How data was recorded
W	Delaying start of work	Duration	A stop watch timer was started when the student entered the room and stopped when the student sat at the table and turned on his iPad. Time was recorded on a data sheet.
R	Staying in Bathroom	Duration	A stop watch timer was started when the student entered the bathroom and stopped when the student exited the bathroom. Time was recorded on a data sheet.

Stage 3 - Collect Data

Student and Staff Interviews. After the intervention phase was concluded, I interviewed the student participants and the staff involved with the intervention, i.e., the other teacher and the two paraprofessionals. Each interview took place in a private one-on-one session in a corner of the classroom. For the purpose of accuracy, I audio recorded and then transcribed each interview. Findings from the interviews are discussed in the Results sub-section.

The rationale for the interview questions that I asked students and staff was based on the key questions of this EPP. I focused on asking questions that would help me arrive at answers to the key questions of the study and come to conclusions about PPRNs and their use in a classroom. In general, the staff and students were asked what they liked and did not like about the PPRN. They also were asked if they would like to continue using them and why. The interview questions for the student participants and the staff can be found below.

Staff

1. Did you like the PPRNs? Why or why not?
2. Would you want to continue using them? Why or why not?
3. Do you feel they are easy to implement in your classroom?

Participants

1. Did you like your story?
2. What did you like about it?
3. Do you want to keep using it?

Stage 4 - Analyze and Interpret Data

The data from the research design, the interviews, and the survey were then analyzed and interpreted. Descriptions of the specific data are summarized below in Table 5.

Table 5 Data and Analysis Procedures for Each Key Question

<u>Key Questions</u>	<u>Data to be Collected</u>	<u>Data Analysis Procedures</u>
Key Question #1: Are PPRNs effective in teaching desirable classroom behaviors and social skills? If so, how quickly and to what degree?	Baseline and intervention observational data and comprehension question data	Quantitative
Key Question #2: How should an educator tailor the design of PPRNs to students with ASD who have different strengths, needs, and learning preferences?	Beta test analysis, comprehension questions, and interview and survey data	Qualitative and quantitative
Key Question #3: What are the perceptions of teachers of students with ASD about the use of PPRNs with students in their classrooms?	Interview and survey data	Qualitative
Key Question #4: (Answering this question is dependent upon obtaining positive answers to Key Question #1.) What professional development training should be provided to teachers of students with ASD to empower them to effectively design and use PPRNs with their students?	Interview and survey data	Qualitative

Stage 5 - Collect Collateral Data

Professional Development Workshop. I also planned, designed, and conducted a teacher in-service professional development workshop at the Brennen School of the

Delaware Autism Program. The workshop was included because the results of the study were positive and I believed that other teachers would benefit from this training. The professional development workshop will be explained further in the Results subsection.

The professional development workshop and a brief questionnaire about it were piloted first to a small group of three staff (teacher, paraprofessional, and psychologist) to assess their validity. Then the workshop was conducted with a group of 10 staff members immediately after data collection with the students was concluded. Staff members included teachers, speech/language pathologists, and school psychologists/behavior analysts. For all but the last of the sections of the workshop listed below I used a PowerPoint presentation displayed on a SmartBoard.

This workshop consisted of the following main sections:

- a. Explanation of PPRNs and an overview of how they are made
- b. Overview of this project and its findings
- c. Presentation of teacher tools and resources, such as Riffel's website
- d. Demonstration of examples of PPRNs
- e. Instruction on how to design a PPRN and how to create one with PowerPoint
- f. An interactive breakout session in which participants used step-by-step instructions to create a PPRN on their school-issued Dell laptops while I offered assistance and suggestions

At the end of the workshop, I administered a brief paper questionnaire to gather information about the participants and their opinions on the training. This questionnaire and the responses are included in the table below.

Table 6 Brief Paper Questionnaire Following the Workshop

Position	B	S	S	T	P	S	T	T	T	P
Years at Brennen	1	21	1	28	9	22	10	6	2	2
Used PPRNs before?	no	no	yes	Not sure	no	yes	no	no	no	no
Used Social Stories before?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Workshop easy to understand? (scale: no-0, yes-10)	3	8	10	10	10	10	10	8	9	7

Key-

B - Behavior Analyst

S – Speech/Language Pathologist

T - Teacher

P - Psychologist

Teacher Survey. Approximately two weeks following the professional development workshop, I contacted, via email, the Brennen School staff who attended the workshop to invite them to complete an online survey that I created using Survey Monkey. The survey questions were constructed to assist in deriving answers to the key questions of this study and to obtain some background information. This survey is described further in the Instruments/Materials sub-section. The survey questions are listed below.

Survey Questions

1. Have you used PPRNs in your class prior to this presentation? (yes, no, not sure)

2. Have you used Social Stories in your class prior to this presentation? (yes, no, not sure)
3. Was the presentation of PPRNs easy to understand? (no-0 to 10-yes)
4. Have you written a PPRN for use in your class? (yes, no, no but I plan to)
5. If you have implemented a PPRN in your class, how do you rate the ease of making it? (0-N/A to 10-easy)
6. If you have implemented a PPRN in your class, how do you rate your students' feelings toward it? (0-N/A to 10-love it)
7. If you have implemented a PPRN in your class, how do you rate your feelings toward it? (0-N/A to 10-love it)
8. What type of further staff development on PPRNs would be valuable to you?

Instruments/Materials

Materials for duration data collection included a stop watch timer and a data recording sheet. PowerPoint software was used to create the PPRNs. Photographs were taken on school-issued teacher iPads for incorporation in the PPRNs. Students watched their respective PPRN on their school-issued individual student iPads. The three viewing times per day were indicated on the group classroom schedule. The students followed a classroom picture schedule. They viewed the PPRNs at their individual seats. They used headphones, if desired. A sample of a classroom schedule can be found in Appendix D.

The comprehension questions and the student and staff interview questions were presented orally to the students and/or staff. A copy of the survey can be found in Tables 8 and 9. The online staff survey was presented via Survey Monkey and was a mix of multiple-choice questions and open-ended questions.

Research Design

A multiple-baseline-across-students single-subject research design was used to evaluate the effectiveness of the PPRN interventions (Barlow, Nock, & Hersen, 2008; Kazdin, 2011; O'Neill, McDonnell, Billingsley, & Jenson, 2011; Riley-Tillman & Burns, 2009). Such designs are widely used to evaluate clinical interventions with small numbers of individuals with disabilities (Richards, 2017; Tawney & Gast, 1984). Single-subject designs provide the special education field an alternative to group research designs (Engel & Schutt, 2008) and are considered to be the most practical types of research designs for individuals with disabilities (Parker et al., 2008). While the large majority of the various single-subject research designs employ an N of one subject, the logic of the multiple-baseline-across-subjects design is based on at least two participants, with most studies that use this design employing two to four participants (Byiers, Reichle, & Symons, 2012; Carr, Moore, & Anderson, 2014; Cowan, Abel, & Candel, 2017; Sansosti et al., 2015).

Both students in this study began their participation under baseline conditions and remained in the Baseline phase until they received the intervention. Student R received the PPRN intervention first. When Student W subsequently received the intervention, Student R continued performing under intervention conditions. The specific pattern is described below.

Initial baseline data was collected on the two participants simultaneously to assess the strength of their target behaviors in the absence of the PPRN intervention. When this study was initially presented, there were three students targeted for interventions. One student was dropped from the study because the student started a medication that eliminated occurrences of the target behavior. Once stability or an ascending trend in the baseline data was established for the participants, the PPRN

intervention was implemented for student R, while Student W continued performing under the baseline condition. Baseline data was considered stable when the range of the last three data points did not exceed 30% of variability from the mean (Alberto & Troutman, 2013). Student W began the intervention phase when his baseline data was stable or ascending and when the pattern of responding to the intervention by Student R was higher than her pattern under the baseline condition and stable across at least three consecutive sessions.

This design was chosen because it can determine the effectiveness of an intervention without the necessity of withdrawing or reversing it. In addition, by using the multiple-baseline-across-students design, I could address more than one student at a time.

Results

Individual student results of the study are displayed in the graph below. Both students had 27 days of data. For both of the students, days they were absent and weekends/days off are not included on the graph. Also, on some school days no data was collected because of staffing needs, but the interventions were consistently implemented. Raw data for both students can be found in Appendix C.

In general, the patterns of responding for both students showed a decline in their target problem behavior durations from the Baseline phase through the Intervention Phase 1 and the Intervention Phase 2.

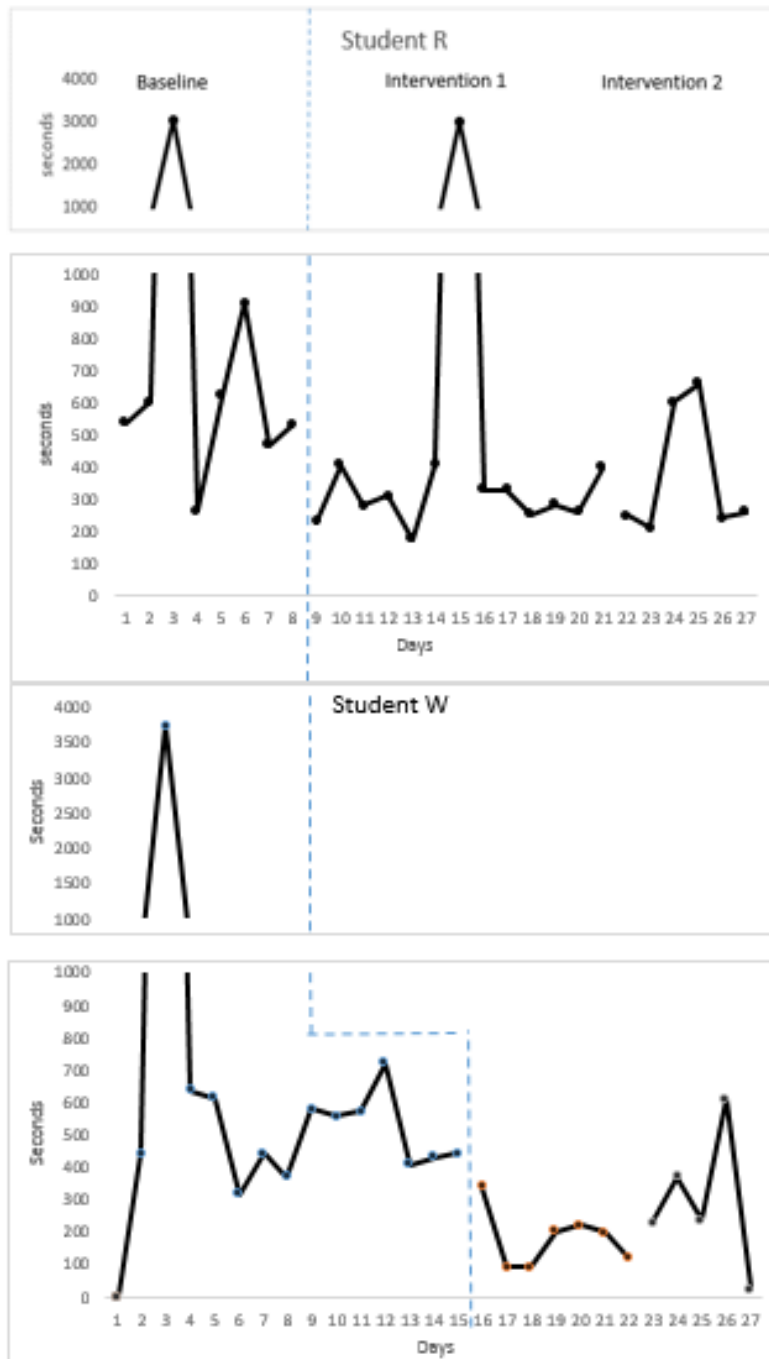


Figure 1 Multiple Baseline Graph Showing Results in the Baseline and Intervention Phases for Students R and W.

Along with the decreases in target behaviors, increases in appropriate replacement behaviors were observed. Instead of delaying the start of his work by sleeping, playing, or refusing, Student W began to go straight to his work area when he arrived at school after the PPRNs were introduced. Instead of staying in the bathroom, Student R came directly out into the classroom to receive her edible reinforcer that she was promised in the PPRN. The improvements in these appropriate replacement behaviors also were noted in the post-intervention interviews with the staff who work with these students.

Means

For Student R, the mean daily duration of the problem behavior during the baseline phase was 876.63 seconds. Her mean duration of the problem behavior during the Intervention Phase 1 was 513.23 seconds, while her mean duration of the problem behavior during the Intervention Phase 2 was 370.00 seconds. If the one outlying data point in Phase 1 is removed, the mean duration of Phase 1 would be lower than the mean duration of Phase 2, that is, 304.75seconds.

For Student W, the mean daily duration of the problem behavior during the baseline phase was 732.64 seconds. His mean duration of the problem behavior during the Intervention Phase 1 was 180.14 seconds, while his mean duration of the problem behavior during the Intervention Phase 2 was 293.14 seconds. Thus, there was a slight increase in the duration of the target problem behaviors from Intervention Phase 1 to Intervention Phase 2.

Levels

Analyzing the data levels is another way to evaluate the effect of an intervention on a target behavior. A levels analysis consists of comparing the change in the magnitude of the target behavior from the last data point of one phase to the first data point of the next phase.

For Student R, the last data point of the baseline phase was 529 seconds and the first data point of the Intervention Phase 1 was 230 seconds. This shows a decrease in level. The last data point in the Intervention Phase 1 was 399 seconds, while the first data point in the Intervention Phase 2 was 250 seconds. This also shows a decrease in level.

For Student W, the last data point of the baseline phase was 433 seconds and the first data point of the Intervention Phase 1 was 338 seconds. This shows a decrease in level. The last data point in the Intervention Phase 1 was 121 seconds, while the first data point in the Intervention Phase 2 was 230 seconds. This shows an increase in level.

Inter-rater Reliability

Inter-rater reliability percentages meet the standards of acceptability for both students according to Alberto and Troutman (2013). Inter-rater reliability data was recorded during each phase of the project for both students. Reliability checks occurred randomly during the three phases. The percent of agreement per phase ranged from 99.14% to 99.78%. The inter-rater reliability data shows consensus between the two raters. Inter-rater reliability was calculated by taking the lesser time, divided by the higher time, multiplied by 100. This formula gave the percent of agreement between raters.

Table 7 Inter-rater Reliability Data

Student and phase	My Time	Inter-rater Time	Difference	% Agreement per phase
R - Baseline	380	384	4 seconds	
R - Baseline	262	263	1 second	
R - Baseline	529	531	2 seconds	99.41%
R - Intervention 1	308	305	3 seconds	
R - Intervention 1	330	330	0 seconds	99.53%
R - Intervention 2	250	249	1 second	
R - Intervention 2	661	660	1 second	99.78%
W - Baseline	614	620	6 seconds	
W - Baseline	315	319	4 seconds	
W - Baseline	578	581	3 seconds	99.14%
W - Intervention 1	338	339	1 second	
W - Intervention 1	200	202	2 seconds	99.45%
W - Intervention 2	370	367	3 seconds	
W - Intervention 2	610	609	1 second	99.59%

Professional Development Training

Ten professional staff members attended the professional development workshop that I conducted at the Brennen School. The attendees were four teachers, three behavior analysts/psychologists, and three speech/language pathologists. Table 6 shows the results of the 3-question questionnaire that was administered directly after the workshop. The overall finding from the questionnaire was that the staff understood the workshop. The average response to the question “Was the presentation of PPRNs easy to understand?” was 8.5 on a scale of 0-10. Additionally, all of the staff noted that they previously had used Social Stories. Only one person mentioned ever having used or created a PPRN prior to the professional development workshop.

An online Survey Monkey survey was distributed via email to the staff who attended the professional development workshop approximately two weeks after the

workshop. The results showed that 60% of the recipients plan to compose a PPRN for their classes and 20% had composed one since the workshop. When asked how they felt about the PPRN that they created, one respondent said, “I think it is amazing and I am so glad to have received this training. It is much more interesting than a typical written Social Story for our kiddos with autism.”

When asked about ease of making a PPRN, one respondent answered the PPRN’s are “relatively easy once I was shown exactly how to set it up”. Another question that was asked was “If you have implemented a PPRN in your class, how do you rate your student's feelings toward it?” The responses to this question were all favorable. One respondent answered “He enjoyed it as watching movies and DVD's are a preferred reward. He liked that he was the star of this show.”

Post-Intervention Interviews

After the study concluded, the three other staff who work with the students were interviewed. All three had positive comments about the PPRNs and their effect on the students. One interviewee mentioned that the students learned the appropriate behaviors that were mentioned in the PPRN very quickly. She noted that PPRN’s were “short and it is easy to find two minutes, three times a day to sneak them in”. The questions and the staff responses are listed below in the table.

Table 8 Interview Questions and Answers from Staff

Questions	Staff M Answer	Staff K Answer	Staff L Answer
Did you like the PPRNS? Why?	“Yeah, I did.” “I thought they were really effective and really engaging for the kids and the students really seemed to enjoy them.”	“I did.”	“Yes. I liked it a lot.” “I felt like since we used the narrative about the specific student and pictures of the student, it kinda... they were able to relate to it...even more so than a typical Social Story.”
Would you continue to use them in your classroom? Why?	“Absolutely.”	“Yes, I think they would work with a majority of our students in this program, if it not successfully, at least as a trial to start setting up and having that routine.”	“Yes, I was thinking... for my students next year... it would be able to help to modify... target some of their behaviors. And help modify them”
Do you feel they were easy to implement?	“Yeah.” “They are really simple to use in the classroom during the school day. They only take a few minutes.”	“Yes.”	“Yes.” “Since they are so short, it is easy to find two minutes, three times a day to sneak them in.”

The two student participants were also interviewed about their feelings and thoughts on their PPRN. While these students with ASD gave typically brief responses to the interview questions, their answers were unilaterally positive about their

experiences with the PPRNs. The questions and the students' answers are included in the table below.

Table 9 Interview Questions and Answers from Target Students

Questions	Answer Student W	Answer Student R
Did you like your story (video)?	"Yes."	"Yes."
What did you like about it?	"It's nice."	"It's good."
Do you want to keep using it?	"Yes."	"Yes, I do."

Chapter 3

DISCUSSION AND CONCLUSIONS

The goal of this project was to provide answers to the key questions proposed in the Introduction section. Those key questions and their answers follow:

Key Question #1: Are PPRNs effective in teaching desirable classroom behaviors and social skills to children with ASD? If so, how quickly and to what degree?

The data from the study show that PPRNs are effective in the case of Student R and Student W. The effect of the PPRNs for both students was shown immediately after the intervention started. As the multiple baseline design graph shows, reduction in the duration of the problem behaviors was consistent and relatively stable across days, with only a very few exceptions.

Looking at the means of the phases helps to determine the interventions' effectiveness. The decrease in means of the target behaviors from baseline to the intervention phases for both students indicates that the changes that were observed are most likely a function of the intervention that was implemented. This shows that these results provide evidence of a functional relationship between implementation of the PPRN interventions and reduction in the target behaviors. The changes in levels adds corroborating evidence to the conclusion of a functional relationship between the interventions and the behavior changes.

Key Question #2: How should an educator tailor the design of PPRNs to students with ASD who have different strengths, needs, and learning preferences?

PPRNs need to be meaningful to each student. It was noted by the staff working with the students that the students were interested and focused on the PPRN pictures of themselves and pictures of their reinforcers. This was mentioned in the staff post-interviews, which can be found in Table 8. Additionally, I noted that students made comments like “It’s me!” and “My candy” while pointing to the screen of their PPRN.

The data from the intervention phases shows that following Riffels’ directions on how to write a PPRN was important, but changing some of her directions was necessary. In my opinion, the changes were necessary to make the PPRN more effective for the students with ASD with whom I work.

When writing the PPRNs, one of the changes that I decided to make from Riffel’s recommendations was to not include pictures of the student engaged in the inappropriate behavior. For Student R, that would have meant including a picture of her in the bathroom, which I felt was not appropriate. For Student W, that would have meant including a picture of him lying on the floor or sitting in a break chair. I felt including those pictures might have given added attention to negative behaviors, which are usually ignored and redirected by his teachers.

From my experience, I was curious to see if providing a tangible reinforcer for reading the PPRN would make a difference in the effects. The results showed that reinforcement of engaging in the PPRN helped to decrease the target behaviors of the students. The data supports my recommendations that teachers should administer a tangible reinforcer to their students for engaging in the PPRN. My observation was

that the students seemed to remember the guidelines presented in their PPRN better during Intervention Phase 1 than in Intervention Phase 2.

Key Question #3: What are the perceptions of teachers of students with ASD about the use of PPRNs with students in their classrooms?

During the post-interview with staff who worked with the two students, they made many positive comments about the intervention. All three staff persons had positive observations about the PPRNs, their use with the students, and the effects on the target behaviors of the two students.

One staff member noted things like the PPRNs were “effective and engaging,” “simple to use,” and “the students liked them.” Another staff person said PPRNs “would work with a majority of our students,” and they are “easy to use.” The third staff person noted that her students “related to it more than a Social Story.” She also mentioned that she would “like to use them next year to target specific behaviors.”

Additionally, one staff member who had participated in the professional development workshop noted that she/he had made a PPRN for one of her/his students. This survey respondent mentioned “He enjoyed it, as watching movies and DVD's are a preferred reward. He liked that he was the star of this show.”

I learned during the implementation of the professional development workshop that the staff appreciated working with me to make a PPRN together that day. Staff actually made a rudimentary PPRN as I guided them through it during the workshop. Comments about this process were very favorable, especially because staff mentioned in the survey that planning time is not readily available for making instructional tools such as PPRNs.

Key Question #4: (Answering this question was dependent upon obtaining positive answers to Key Question #1.) What professional development training should be provided to teachers of students with ASD to empower them to effectively design and use PPRNs with their students?

As noted, giving staff specific professional development training in which they can make PPRNs would be very beneficial in terms of time and learning content. In addition, according to the surveys returned by the Brennen staff, things like further training and specific suggestions for different ages and levels are desired. Staff reported desiring support with the technical aspects, e.g., PowerPoint and voice-over work.

Another aspect mentioned a few times by staff in the survey was the lack of sufficient planning time for professionals at the Brennen School. One staff member said there was “not enough time with all the end of the year activities” to try something new like a PPRN. Another respondent noted that “Not having planning time to create one” was what was causing him or her to delay making a PPRN.

Key Question #5: [Please note: Key Question #5 was added after the project proposal was approved.] Compare and discuss Intervention 1 and Intervention 2. Does a PPRN work equally well with and without tangible reinforcement?

The data show that the PPRNs that I designed were more effective with tangible reinforcement for reading the PPRN than with social reinforcement. However, the number of days of implementation was shorter for Intervention 2 than for Intervention 1. We could be more confident about this finding if Intervention Phase 2 was as long as Intervention Phase 1.

Anecdotally, the staff found that students were more engaged in the PPRN on days when the tangible reinforcer for reading it was added. Staff felt the students seemed to be more attentive to the stories knowing they would be receiving the edible reinforcer after they watched the story. Overall, conducting this study again with additional time in Intervention Phase 2 would be interesting and necessary to determine the relative strength of Intervention 1 versus the strength of Intervention 2.

Statement of Limitations

This study obtained evidence of a functional relationship between implementation of PPRNs and decreases in the target problem behaviors. However, these conclusions should be considered in light of the following limitations.

First, the study was conducted over the course of eight weeks with two students. Eight weeks is a relatively short period of time to study the effects of interventions on students. A more accurate view of the effects of the interventions might be achieved if the study were conducted over a longer period of time.

Second, the sample of participating students with ASD is small. While the two students might not represent the majority of students with ASD, the purpose of a multiple-baseline-across-subjects single-subject design is explicitly to evaluate effects of an intervention on the specific needs of specific participants. Future studies with different children would reveal the robustness of the interventions.

Third, the duration of Intervention Phase 2 was shorter than the other two phases of the study due to time constraints. As mentioned, this makes interpretation of the data gathered during that phase more tentative than that of the other two phases. I would have been able to draw more confident conclusions about the effectiveness of a

PPRN plus tangible reinforcement of the PPRN readings if Intervention Phase 2 ran for a longer period of time.

Summary

Given these limitations, the findings of this study make several unique contributions to the literature on the use of digitized Social Stories and PPRNs to reduce inappropriate behavior and teach appropriate behavior to children with ASD. First, this study documents the effects of PPRNs in reducing unwanted behaviors. Second, the role of reinforcers in teaching students to use and benefit from PPRNs was examined and the results suggest that the combination of PPRNs and tangible reinforcers may enhance the clinical effects.

In conclusion, this study provides preliminary evidence that PPRNs are an effective intervention for children with ASD. Immediately following implementation of the PPRNs, the participants demonstrated a decrease in duration of the target problem behaviors compared to their baseline performance and these reductions continued across days. The interventions that included tangible reinforcement of the reading of the PPRN resulted in greater benefit, although more research is needed to more fully examine this possibility.

Recommendations

I recommend that the results of this study should be interpreted with caution. Additional research will be helpful in determining how to make Social Stories and PPRNs more effective for individual students. Future research should also examine how to design and use PPRNs to achieve enhanced maintenance and generalization of new skills. Teaching maintenance and generalization of skills is particularly important

for children with ASD. Many studies have shown that children with ASD typically do not automatically maintain and generalize newly learned skills (Sansoti & Powell-Smith, 2008).

My recommendation to my administrators of the Brennen School is to offer systematic PPRN training to our school's instructional staff. I believe that this training can be done effectively online. When asked in the online survey after my PPRN professional development workshop, respondents indicated that additional training is necessary and desirable. The final question on the survey was "What types of further staff development on PPRNs would be valuable to you?" One staff person remarked, "I don't think that there necessarily needs to be a staff development day on it. If a PowerPoint presentation/YouTube video/etc. were to be made on how to create a PPRN, I think that would be sufficient. Lots of people are familiar with the idea of social stories, this is mildly changing the format and it is more of showing individuals how you do it and a staff development day is not totally necessary." Another staff member answered, "Maybe just more ideas to take it further or show and share to see how creative folks are getting with this technology." Another staff member added, "Since it is essentially a social story, more training on developing Social Stories."

Overall, I believe that PPRNs show high potential to be a useful contribution to the repertoire of teacher interventions for students with ASD. PPRNs help with the local problem of how Brennen School teachers can minimize the barriers of reading and low engagement when using a Social Story as an intervention for reducing inappropriate behaviors and teaching prosocial behaviors to their students with ASD. The barrier of having to read is removed with a PPRN because the story is played audibly and the PowerPoint presentation vehicle capitalizes on students' strong

tendency to engage with technology. I also believe that this study is suggestive that a PPRN plus reinforcers might provide additional help with low engagement. My experiences cause me to believe that skilled use of PPRNs should be in the repertoire of teachers of who work with students with ASD. I believe that teachers will resonate with the ease of their use and they will achieve beneficial outcomes for their students.

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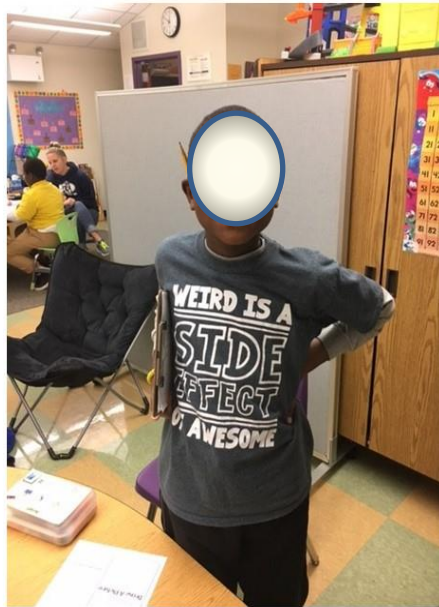
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Appendix A
STUDENT W'S PPRN



My name is Israel. I go to
Maclary Elementary and
I am a cool kid.



Sometimes I get upset and don't listen to my teachers. I hit, kick, run, and climb.



When I don't listen to my teachers I can not earn treats or get on YouTube.



When I get upset I should go to the mat to take a break.



My teachers, Mom,
and Dad are proud
of me when I take a
break on the mat
instead of hitting,
kicking, running,
and climbing.



When I get upset I
can also take a
break on the
butterfly chair.





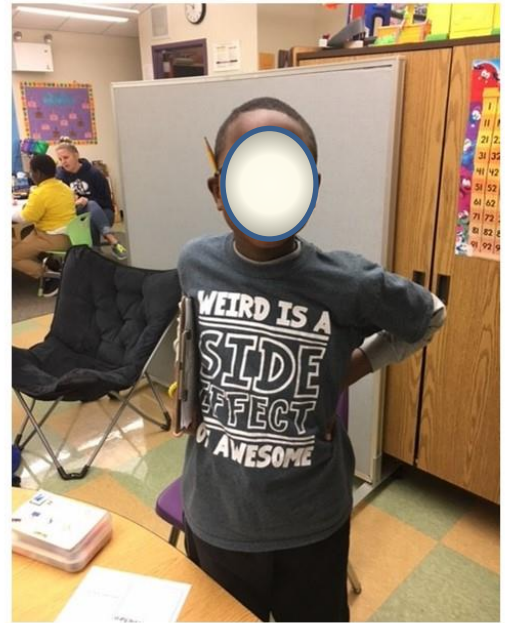
When I take a break on my mat or the butterfly chair, I can earn a piece of my YouTube puzzle.



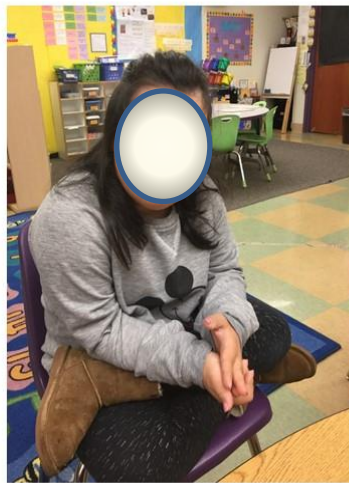
When I have 2
puzzle pieces I will
earn YouTube for 10
minutes.



My teachers, Mom,
Dad, and friends
are so proud of me
when I take my
break on the mat or
butterfly chair!



Appendix B
STUDENT R'S PPRN



My name is Regan. I go to Maclary Elementary School and I am a cool kid.



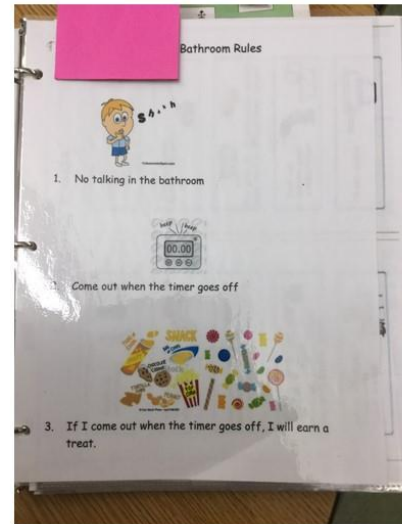
Sometimes I stay
too long in the
bathroom.



When I stay in the bathroom too long, I can not earn treats.



When I go to the bathroom, I need to use the toilet and wash my hands. I need to have a quiet voice, and finish up quickly.



My teachers, Mom, and Dad are proud of me when I come out of the bathroom when the timer goes off, instead of staying in the bathroom and singing, talking to myself, and looking in the mirror.

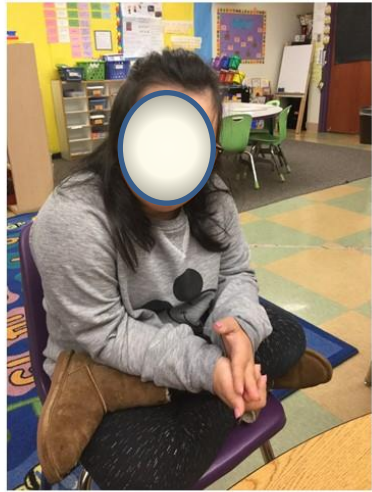




When I come out of the bathroom when the timer rings, I can earn some treats and a sticker.



My teachers, Mom,
Dad, and friends
are so proud of me
when I earn my
stickers and treats
for coming out of
the bathroom!



Appendix C

RAW DATA

R. time in the bathroom (in seconds)

Day	Baseline	Intervention 1	Intervention 2
1	539		
2	603		
3	3080		
4	262		
5	620		
6	911		
7	469		
8	529		
9		230	
10		406	
11		280	
12		308	
13		175	
14		406	
15		3015	
16		330	
17		330	
18		252	
19		281	
20		260	
21		399	
22			250
23			208
24			602
25			661
26			240
27			259

W. time until start of day (in seconds)

Days	Baseline	Intervention 1	Intervention 2
1	440		
2	3738		
3	635		
4	614		
5	315		
6	440		
7	370		
8	578		
9	555		
10	571		
11	720		
12	409		
13	429		
14	443		
15		338	
16		90	
17		90	
18		200	
19		219	
20		197	
21		121	
22			
23			370
24			236
25			610
26			21
27			20

Appendix D

SAMPLE CLASSROOM SCHEDULE

8:15	Breakfast
8:30	Video
8:35	Meeting
9:00	Cashout
9:30	Reading
10:15	Centers
11:30	Video
11:35	Lunch
12:00	Recess
12:35	Work
1:00	Cashout
1:15	Math
1:45	Writing
2:15	Video
2:20	Cashout
2:45	Home

Appendix E
IRB APPROVAL



Rectangular Stamp
RESEARCH OFFICE

210 Hulihan Hall
University of Delaware
Newark, Delaware 19716-1551
Ph: 302/831-2136
Fax: 302/831-2828

DATE: May 3, 2017

TO: Carly Henry, M.Ed
FROM: University of Delaware IRB

STUDY TITLE: [1055002-1] PowerPoint Relationship Narratives as an Intervention for Students with ASD

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS

DECISION DATE: May 3, 2017

REVIEW CATEGORY: Exemption category # (1)

Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Nicole Farnese-McFarlane at (302) 831-1119 or nicolefm@udel.edu. Please include your study title and reference number in all correspondence with this office.