The Effect of Social Stories on the Social Interactions of a Student with ASD in Unstructured School Activities

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Abstract

The purpose of this study was to determine whether using social stories would impact the social interactions of a student with an autism spectrum disorder (ASD) during unstructured times at school, specifically during centers and lunch. Observations were conducted before, during, and after the intervention to determine the mean frequency with which the student engaged in conversations. Descriptive statistics also were compiled from surveys to determine the quality of the student's conversations with assigned lunch buddies. The only significant change in the frequency of conversations was between the pre and post phases during center times. Student perceptions of the number of conversations were not always consistent, but their perceptions of the intervention and the quality of conversations were generally quite positive. Conducting future studies over more extended periods of time and using larger samples might help more fully assess the effectiveness and perceptions of using social stories to facilitate social interactions among students with ASD.

CHAPTER I

INTRODUCTION

Overview

Students struggling with Autism Spectrum Disorders (ASD) often demonstrate difficulties with skills that their peers without such a diagnosis easily exhibit on a daily basis. Students with disorders on the spectrum often need more assistance with social skills and appropriate peer interactions. These skills can include initiating and maintaining conversations as well as making eye contact and responding appropriately to various situations that present themselves to the student. Unnecessary stress, feelings of depression, and outbursts of anger can result from not knowing how to respond to classmates or educators (Denning, 2007).

Due to the prevalence of autism spectrum disorders, interventions are needed to help students develop the social skills that will help them to both initiate and maintain dialogues and engage in positive social interactions with peers. Such interventions can help students be successful in both social interactions and in attaining their learning objectives.

This researcher became interested in exploring this issue in her role as a kindergarten teacher. She observed that a student in her class struggled with skills detailed in the above paragraphs. As a result of her desire to meet the students' needs more effectively, she decided to conduct a study that would examine the effectiveness of one type of intervention on the social skills of the student.

Statement of Problem

There are a variety of resources available to educators which are designed to increase the social skills of students with a range of disabilities. Social stories are one such example for students with ASD. The purpose of this descriptive case study was to examine the effect of a

classroom-based intervention (social stories) on social interactions (i.e., initiating and maintaining conversations with peers as well as the quality of conversations) for a student with ASD and his peers.

Hypotheses

The main null hypotheses to be tested were that the frequency of observed conversations between the student and his peers would be the same before, during, and after the implementation of a social stories intervention. Specifically tested was the following for both lunch and center times:

ho_{1a}: mean frequency of observed lunch conversations before intervention = mean frequency of observed lunch conversations during intervention = mean frequency of observed lunch conversations after intervention

ho_{1b}: mean frequency of observed centers conversations before intervention = mean frequency of observed centers conversations during intervention = mean frequency of observed centers conversations after intervention

To assess the perceived frequency of the student's conversations, the null hypothesis below was tested twice using both the student's and his lunch buddies' ratings to see if there were significant differences in their reports of the frequencies of their conversations at lunch before, during, and after the intervention.

ho_2: mean reported number of lunch conversations before intervention = mean reported number of lunch conversations during intervention = mean reported number of lunch conversations after intervention

Additional descriptive analyses and tallies of student replies to survey items about their conversations also were conducted to help determine how the social stories intervention affected

the students' conversations and how the social stories were perceived. Items assessed included who initiated conversations and the topics and tones of the conversations.

Operational Definitions

The independent variable in this study was the use of social stories. **Social stories** are brief stories that are customized to the students' needs and assist in learning particular social skills. Each social story is written in language that is age-appropriate for the reader and even can provide pictures which model the skills. The stories are designed to break complex ideas down in ways that are meaningful and attainable to the student. The short length of the stories allows them to be implemented easily within the classroom setting and provides more opportunities for review of each story.

Two dependent variables were assessed in the study. The first dependent variable in this study was the **frequency of observed conversations with peers**. The mean frequency of interactions was computed via observations which determined whether the participant was engaged in a conversation with his peer(s). This was measured by a number which indicated whether or not the student was engaged in conversation each time he was observed at set 10 minute intervals during the centers and lunch periods.

The second dependent variable was the **quality of interactions** with peers. This was measured by obtaining ratings on two surveys of the perceptions of social interactions from the participant and his peers. The mean quality of interactions was computed by collecting student and peer ratings of the quality of conversations and the usefulness of the social stories through surveys provided to peers each day. One survey was provided to the participant each day and his peers on days they participated in the intervention group to determine what they thought about the social stories and if they thought the stories were helpful in interacting with peers in the

classroom. A second survey also was completed each day by the specific peer that the participant selected as his lunch buddy to determine who started the conversation(s) at lunch, if one occurred, and how it went.

During the study, data collection occurred during center time and lunch which are unstructured instructional time periods. These time periods occurred when students were free to interact with one other independently and are not provided specific instruction.

Center time was a 50 minute block of the school day during which students moved throughout the classroom and interacted with their peers without guidance from an educator. During this time, students first completed an assignment that related to a skill they learned during the week. There were four assignments that the students rotated among throughout the week. They had to complete one assignment per day and upon completion, they could then move to an activity center. During this portion of center time, students had three activity centers that they could move to freely. Their center groups were comprised of four to five students and those students moved freely and interacted at the same activity centers each day. The center assignments changed each day for four days and on the fifth day, students were not required to complete an assignment but instead had free choice of any of the activity centers in the classroom.

Lunch time was a 30 minute block during which the students in this class were allowed to choose freely which classmate they would like to sit near. They could choose to sit anywhere at two designated tables in the cafeteria. During this time there were three to four adults in the cafeteria assisting with the students. A lunch buddy was selected by the participant and the two peers selected where they would like to sit.

A **lunch buddy** was selected by the student of interest each day. This was a person within the participant's class that he chose to sit next to during the lunch period. The purpose of allowing the student to select the lunch buddy was to give him a peer to sit beside with whom he was likely to engage in a conversation.

CHAPTER II

REVIEW OF LITERATURE

This literature review examines difficulties that children on the autism spectrum have with social interaction. Section one provides background information on autism spectrum disorders. It describes characteristics that are specific to children with such a diagnosis. Section two provides information on how autism impacts children who are mainstreamed in general education classrooms and what effects mainstreaming can have on their ability to learn and interact. Specifically, it will examine how this diagnosis can impact a student's ability to respond appropriately to situations and interact with classmates. The final section of this review examines possible interventions that can be used in order to assist children with autism with social interaction and improve their social skills. The two interventions that will be described are social stories and peer-based interventions. This section will provide background information on each intervention as well as describe the purpose of each and how the interventions are implemented.

Autism Spectrum Disorders

Autism Spectrum Disorders (ASD) are a group of disorders that are characterized by deficits in socialization, and communication, and people with this diagnosis often exhibit unusual behaviors and interests (Nicholas,et al., 2008). There are five types of disorders that generally are included on the autism spectrum. These include: Autism, Asperger's Syndrome, Rett Syndrome,

Childhood Disintegrative Disorder, or a pervasive developmental disorder, not otherwise specified. *(*Nwokeafor, 2009).

According to the American Psychiatric Association (2012), there are several characteristics that are associated with Autism Spectrum Disorders. Poor communication is one characteristic. People with ASD focus attention on a few topic areas and frequently repeat phrases. They also may have difficulty relating to people, things, and events. In addition, they have limited eye contact, struggle to read facial expressions, and struggle interacting with peers. Another characteristic is repetitive body movements such as hand flapping and repeating sounds.

The severity of each disorder on the spectrum can vary from person to person (Denning, 2007). It is estimated that three to six children out of every 1,000 births will be diagnosed with a spectrum disorder (Nwokeafor, 2009). Nwokeafer states that of those children, males are four times more likely to receive the diagnosis than females. Denning explains that disorders on the spectrum are linked closely to depression, limited job success, and poor relationships. In order for a diagnosis to be made, impairments in three domains must be identified. These domains include social interaction, communication, and restricted interests and repetitive behaviors (Russell, Kelly, Ford, & Steer, 2012). There are many characteristics that are apparent in children and adults with ASD. Some of these include emotional and behavioral problems such as mood swings, temper tantrums, emotional instability, and disruptive behavior (Nicholas et al., 2008). People with ASD spend less time in proximity with others and engage in fewer peer initiations (Koegel,Vernon, Koegel, Koegel, & Paullin, 2012).

Asperger syndrome is one disorder that is found on the Autism spectrum and can be considered a form of high-functioning Autism (Denning, 2007). Children with high functioning Autism or Asperger syndrome also have characteristics that include struggling with pragmatic

language skills such as turn-taking, eye-contact, initiating and ending conversations, and difficulty understanding cues that the listener is no longer engaged in the conversation. Additional characteristics include unusual voice, difficulty following rules, and trouble with losing in games or activities. Children with Asperger's can be upset easily by change in routine. Finally, Denning explains that what often is referred to as the "hidden curriculum" which includes the subtleties that other students grasp easily, can be difficult for children with a spectrum disorder. While there currently is not a cure for Autism, it is suggested that an early diagnosis and intervention can ensure improvements in all of the characteristics described above (Nwokeafor, 2009).

Impacts in the Classroom

Children diagnosed with Autism are faced with numerous obstacles that they must overcome on a daily basis. There is no question that these challenges impact the learning that takes place in the classroom. Some children may have much higher intelligence than their peers while others have significantly lower intelligence (Nwokeafor, 2009). Children with Autism face challenges due to the lack of imitation and joint attention skills. Much of what younger children learn is learned by observation and imitation. Therefore, children with a diagnosis of Autism have a more challenging time learning new skills by imitating others. In addition, their poor joint attention skills will limit their ability to be able to pay attention to something that is pointed out to them by another. This not only would impact their learning from the teacher, but it will also impact their interactions with peers. Being unable to focus on what the teacher is teaching will result in the inability to comprehend the new material that is taught.

"Since one of the dilemmas of Autism spectrum disorders is the inability of the child with Autism to communicate, and interact with others, the tendency to process and react to learning as

an observational participant (Observational learner) is very minimal at most or not there at all" (Nwokeafor, 2009). Autism impacts a child's learning by interfering with communication. The process of learning requires interaction and since children with Autism lack an ability to interact and communicate with their peers, they are often unable to understand their teacher and unable to be understood by their peers. Nwokeafor explains that because of the neurological and perceptual traits of children with ASD, it is necessary for educators to reconsider how they educate a child on the spectrum.

As noted, children on the spectrum also frequently have emotional and behavioral problems. In the classroom, these can be observed through internalizing or externalizing behaviors (Lierheimer & Stichter, 2012). When children with ASD internalize behaviors, they appear withdrawn, depressed, or anxious. Withdrawing from peers can limit their ability to work with partners, discuss topics, or complete group tasks. Children with ASD who externalize behaviors pose a much greater challenge when mainstreamed in the classroom. These students can be aggressive, destructive, overreact to situations, ignore teacher directions, and disregard classroom rules. These behaviors can disrupt the classroom environment severely, and make learning difficult for all students. In addition, such behaviors can make it difficult for the teacher to teach effectively.

According to Snider and Battalio (2012), approximately 10% of school age children have social skills deficits severe enough to be rejected by their peers. A lack of social skills can severely impact learning because students need to interact with one another on a daily basis and the majority of students with ASD have difficulty doing that. A child who cannot read will struggle in reading, math, and other content areas; however, a child who cannot interact with

peers will struggle whenever human interaction is required and often accommodations and modifications for students with such deficits are more difficult to implement.

Interventions

There are many interventions available for educators to use that are designed to assist students with ASD. Many of the interventions focus on increasing social skills in students with these disorders because having poor social skills is one of the biggest obstacles children on the spectrum face. One intervention that commonly is used by educators is called social stories. Another intervention that can be used to increase social skills in students with ASD is the use of peer-based interventions.

Social Stories

A social story is a short story that is personalized to meet the student's needs and is written from the perspective of the student (More, 2008). These stories teach a specific behavior and also explain the reactions of others in various circumstances (Carter, Sisco, Yun-Ching Chung, & Stanton-Chapman, 2010). Social stories use a variety of sentences and can be written at the student's individual reading level and may use visual cues if necessary (More, 2008). This intervention is unique because the story is so short. The short length makes it convenient to implement within the classroom. More explains that to implement a short story, the teacher should select a targeted behavior such as gaining the attention of a peer or how to play a game. He or she then develops a story which will guide the student on how to successfully achieve that behavior. The length of the story allows it to be-imbedded easily in the classroom routine and allows for increased communication among the parent, teacher, and student by allowing the parent to identify issues that are occurring in the class and review them at home if necessary.

More further explains that social stories take complex ideas and break them down into smaller components so that they are easily understood With so many recent gains in technology, More reflects that social stories also can be implemented effectively using the computer which could potentially provide a more engaging means to present the social story to the student.

Peer –Based Interventions

Peer-based interventions provide another approach to increase social skills in students with ASD. These interventions include a variety of methods which involve using peers in the classroom to assist and model appropriate social behavior for students who lack these skills, ultimately allowing the classmates to take over the role of the instructor in social skills (Harjusola-Webb, Hubbell, & Bedesem, 2012). Some examples of these interventions include assigning roles so that during activities social interaction is encouraged because students have a specific purpose. Other examples include peer awareness training, peer interaction training, and peer networks (Carter, et al., 2010). Additional interventions include peer support arrangements and peer tutoring. At lower grade levels, examples of interventions include peer proximity, such as playing next to the targeted child, peer prompting and reinforcement, such as giving a "high five," and peer initiation which involves requesting to play (Harjusola-Webb, et al., 2012) In all of the above interventions, classmates of students with ASD serve as guides to assist students to improve social skills. Using the peer awareness training, classmates gain an understanding of disabilities among peers whereas peer support arrangements allow classmates to provide ongoing academic and social support to their disabled peers while under the supervision of an adult. The purpose of these interventions is to focus on natural peer interactions that are less adult guided while at the same time still providing some guidance to students with disabilities. Research suggests that when peers are used as role models it can be more advantageous than teacher

modeling for increasing the quality and quantity of social behaviors in natural environments (Harjusola-Webb, et al., 2012).

In order to implement peer-based strategies, training must take place in various social communicative strategies so that peers have an understanding of socially appropriate behaviors (Harjusola-Webb, et al., 2012). This will ensure that students in the class can implement the strategies effectively and meet the needs of their peers.

Summary

This review of literature suggests that a significant amount of research has been done on assisting children with Autism spectrum disorders to make gains in social skills. The interventions described above are just two examples of interventions that can be implemented conveniently within the classroom setting and both are suggested to have meaningful benefits for students. Whatever method is used, researchers agree that the most appropriate way to improve social skills in students with these disorders is to apply the interventions during meaningful activities and in a natural environment (Ingersoll, et al., 2012).

CHAPTER III

METHODS

The purpose of this action research study was to examine the effects of an intervention on the social skills of a child on the autism spectrum. The study was a descriptive case study with a sample size of one. The main participant in this study was a six year old kindergarten student with a disability on the autism spectrum. The participant was the only student in a class of 17 with significant needs and an IEP addressing needs related to a spectrum disorder. He struggled with peer interactions and occasionally had outbursts when his structured routine was disrupted

or when he felt as though he was being left out. The participant regularly had a special educator in the classroom during unstructured times (centers) to assist him when needed. The study was conducted over a period of four weeks. The pre-intervention phase was one week in length, the intervention phase was two weeks, and the post intervention phase was one week. During the intervention phase of the study, the intervention (social stories) was provided in a small group setting with peers in the classroom once per week (twice total) and daily to the participant individually the other four days of the week. Data also were collected from peers assigned as group members and buddies to evaluate their perceptions of their interactions with the student and of the social stories intervention.

Instrument

Data were collected through observations and rating scales/surveys. Observations were made to determine the frequency of conversations. Surveys were used to assess the quality of the interactions among students and students' perceptions of the social stories

Frequency of Conversations

The participant was observed during two relatively unstructured periods of the school day, center time and lunch. The participant was observed in ten minute intervals during these times and every ten minutes, the researcher documented whether or not the participant was engaged in a conversation.

Quality of Interactions

The quality of interactions was measured by ratings obtained from surveys completed by the participant and the peers assigned to sit with him at lunch. The surveys questioned the participant and the peers to determine how many conversations occurred and how many of those conversations were started by the participant. The surveys also questioned what topics were

discussed during the conversations and the tone of the conversations. The researcher or special educator observed the interactions that the participant had with peers and recorded notes about those interactions which provided a more detailed account of how the participant was able to interact with his peers.

Student Perceptions of Social Stories

The perceptions of the participant and peers in the class were documented through the completion of surveys. These surveys questioned whether or not each of students who participated in small group social story instruction liked the social stories and if they thought they helped the students participate in more meaningful conversations. Descriptive statistics from the surveys were computed to see how well the students liked the social stories, and how they thought the stories impacted their ability to have meaningful conversations.

Procedure

In order to conduct this research study, the researcher identified the most significant needs of the participant. In this case, the skill that was determined to be most significant was the participant's difficulty engaging in conversation with peers and the quality of those conversations. When examining the quality of the conversations, the researcher examined who initiated the conversations, the topics and tone of the conversations, and whether or not the participant and peers felt that the social stories assisted them in having conversations with their peers. The four-week duration of the study was divided into three time frames. The first time frame occurred during the week before the intervention was provided. During the second time frame, the intervention was provided for two weeks. The third time frame occurred during the week after the intervention was provided.

To measure the dependent variables in the study, the frequency and quality of conversations, the researcher collected data during unstructured class settings. During the pre-intervention stage, the researcher or special educator in the classroom observed the student at set intervals during center time and lunch time to determine how frequently the participant engaged in conversation. The participant was observed every ten minutes during these times. Center time was approximately 50 minutes and the lunch block was approximately 30 minutes. During the observation at center times, the students in the classroom completed an assignment at their designated literacy center and then selected an activity center of their choice during the remaining portion of this instructional block. During the lunch block, the kindergarten assistant who was assigned to the students observed the conversations in which the participant was engaged and recorded the information on the data collection sheet. The participant also selected a lunch buddy each day and he and this peer were surveyed at the end of lunch in order to provide insight on the quality of conversation between the participant and the peer. Specific data that were collected included whether or not a conversation occurred and how often the participant or peer started the conversations. The quality of conversations was determined through the data collected from the daily peer and participant surveys. Two surveys were conducted per day. One was from the participant and the other from the lunch buddy. Both surveys related to conversations during lunch.

During the two week intervention time frame, a social story was customized for the student and was read with the student independently four times per week and in a small group setting once each week on Wednesdays. The composition of the small group varied each time and was comprised of peers with whom the participant interacted on a daily basis. The social stories provided the participant with strategies that could have be used to begin conversations as

well as talking points that could be used to carry on the conversation. Examples of a talking point included follow-up questions that could be used to continue a conversation after a peer responded and suggested topics for conversations with a peer. During the small group setting, the participant and his peers were able to practice the strategies discussed in the social story. Observations continued during the two specified unstructured class periods, the center and lunch blocks. In addition to this data collection, the perceptions of the participant and his peers were measured through the use of surveys. One survey was provided to the all of the participants who read the social stories in the small group setting one time per week. The surveys questioned whether the peers thought the social stories were helpful and whether or not they felt their conversations with peers were more meaningful after hearing the social stories. Another survey was provided to the participant and the designated lunch buddy daily to document how conversations went between them, including the topic, tone, and who initiated the conversation.

After the two weeks of intervention, the researcher continued one more week with the data collection methods which measured the frequency of observed conversations and the quality of the conversations. Surveys also were conducted with the lunch buddy and the participant to gain perceptions about the conversations occurring each day.

CHAPTER IV

RESULTS

The initial two hypotheses of interest were tested to see if the observed frequencies of the participant's conversations at lunch and centers were impacted by the social stories intervention. Mean numbers of observed conversations in lunch and at centers were compared before, during and after the social stories intervention. (Conversations were recorded by the classroom teacher or special education assistant as occurring or not every 10 minutes during lunch and at centers.**)**

Lunch Data

The descriptive statistics and results of the one-way ANOVA comparing the mean number of times the participant was observed conversing during lunch in the pre-intervention (five days), during (eight days of 10- excludes the two lunch bunch days when observations were not made), and post-intervention (five days) phases are found in Tables One and Two.

Table 1

Descriptive Statistics for Observed Lunch Conversations

	N	Mean	Std. Deviation	Std. Error
Pre	5	1.4000	.54772	.24495
Intervention	8	2.0000	.75593	.26726
Post	5	1.4000	.54772	.24495
Total	18	1.6667	.68599	.16169

Table 2

ANOVA results comparing mean frequency of Observed Lunch Conversations

Total Lunch Conversations	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.600	2	.800	1.875	.188
Within Groups	6.400	15	.427		
Total	8.000	17			

As can be seen in Table Two, the ANOVA indicates ($F=1.875$, $p<.188$), the null hypothesis was retained as the frequency of lunch conversations did not differ significantly across the intervals.

Centers Data

Table Three provides descriptive statistics and results of the one-way ANOVA comparing the mean number of observed conversations during centers in the pre-intervention (five days), during (10 days), and post-intervention (five days) phases.

Table 3

Descriptive Statistics for Observed Centers Conversations

	N	Mean	Std. Deviation	Range	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
PRE	5	1.800	.8367	1-3	.3742	.7611	2.8389
INTERVENTION	10	2.800	1.0328	1-4	.3266	2.0612	3.5388
POST	5	3.600	.5477	3-4	.2450	2.9199	4.2801
Total	20	2.750	1.0699	1-4	.2392	2.2493	3.2507

Table 4

ANOVA results comparing mean frequency of Observed Centers Conversations

Total Centers Conversations	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.150	2	4.075	5.094	.018
Within Groups	13.600	17	.800		
Total	21.750	19			

Multiple Comparisons Total Centers Conversations						
Scheffe						
Phase	Phase	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Pre	During	-1.000	.4899	.155	-2.3130	.3130

	Post	-1.800*	.5657	.019	-3.3161	-.2839
During	Post	-.800	.4899	.290	-2.1130	.5130

The ANOVA and follow-up multiple comparisons indicated that the number of conversations observed at centers in the pre- and post-phases differed significantly at the .05 level (mean difference = -1.8, $p < .019$), so for centers, the initial null hypothesis was rejected as the frequency of conversations did differ significantly across two of the study's intervals.

Survey Data

Descriptive statistics and frequency data regarding student replies to survey items about how many conversations were had, who initiated the conversations, and the conversations' topics and tones are presented below. An ANOVA was conducted to compare the participant's and his peers' mean replies about the number of conversations held at lunch across the three study phases. Descriptive statistics and tallies were also computed to compare how many conversations the participant and peers each reported starting and their perceptions regarding the topics and tones of their conversations.

The number of conversations each participant reported took place and how many the participant himself and his peers felt they started over the course of the study were reported. By dividing the total number each participant reported initiating by the total number he reported took place each day on the Daily Survey for Student and Lunch Buddy, a "percent of conversations you started" value was yielded for the subject and his lunch buddies for each day of the study. Descriptive statistics of this variable follow in Table 5.

The lunch buddies reported a greater number of conversations took place on average per lunch (2.667) than the main participant (1.389). However, a T-test for independent samples indicated that these two means were not statistically significantly different ($t=-1.861$, $p < .071$). Descriptive statistics are found in Table 5 and the T-test results are in Table 6.

Table 5

Descriptive Statistics for Conversation Number, Initiator and Percent Initiated

N=18 each for all three phases		Mean	Std. Deviation	Range
SELF	Number conversations	1.389	0-5	0-5
	Number conversations YOU started	.667	0-2	0-2
	Percent you Started	48.002		
LUNCH BUDDY	Number conversations	2.667	0-12	0-12
	Number conversations YOU started	1.389	0-5	0-5
	Percent you Started	52.083		

Table 6

Independent Samples T-test for Equality of Mean Number of Reported Conversations

t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
					Lower	Upper
-1.861	34	.071	-1.278	.687	-2.67323	.11767

Equal variances assumed

Results of a T-test for independent samples comparing the mean number of conversations the participant (.667) and his peers (1.389) reported initiating follow in Table 7. Results indicated that these means for this item were also not statistically significantly different (t=-1.991, p <.055).

Table 7

Independent Samples T-test for Number conversations You Started

	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Number Conversations YOU started	-1.991	34	.055	-.722	.363	-1.460	.015

Equal variances assumed

Finally, the percent of conversations the respondents indicated they started was compared across the subject and lunch buddy groups. Note that the numbers for the means differ from the overall means above in Table 5. This occurred as for three reports, there was no percentage calculated as the students reported no conversations took place, despite informal observations to the contrary. The analysis indicated that the mean percent of conversations respondents reported they started (52.5 for the student and 55.4 for the peer lunch buddies) did not differ significantly across groups (t= -.195, mean difference =-.0289, $p < .847$).

Table 8

Descriptive Statistics for Percent of Conversations You Started

		N	Mean	Std. Deviation	Std. Error Mean
Conversations YOU Started	SELF	16	.525	.42817	.10704
	PEER	17	.554	.42384	.10280

Table 9

Independent Samples T-test for Percent of Conversations You Started

	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Percent conversations YOU Started	-.195	31	.847	-.0289	.1484	-.3315	.2737

Equal variances assumed

To test the second main null hypothesis, which is below, and see if student perceptions were similar to the observers', ANOVAS were run to compare the main participant student's and his lunch buddies' perceptions of the numbers of conversations they engaged in at lunch across the stages of the study.

ho_2: mean reported number of lunch conversations before intervention = mean reported number of lunch conversations during intervention = mean reported number of lunch conversations after intervention

Results follow in Table 11 and indicate that the only statistically significant difference in perceived mean number of conversations at lunch was between the lunch buddies' means in the pre phase and the post phase ($p < .044$). Across these intervals, the mean number of conversations lunch buddies reported engaging in decreased from 5.2 to 1.2. Interestingly, both the main participant and his peers reported fewer conversations occurred as the study ensued.

Table 10

Descriptive Statistics for Number Conversations by Phase of Study by Reporter (Self or Peer/Lunch Buddy)

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	Range

						Lower Bound	Upper Bound	
SELF	Pre	5	**1.800**	**1.92354**	.86023	-.5884	4.1884	0-5
	During	8	**1.375**	**.51755**	.18298	.9423	1.8077	1-2
	Post	5	**1.000**	**.70711**	.31623	.1220	1.8780	0-2
	Total	18	**1.389**	**1.09216**	.25742	.8458	1.9320	0-5
PEERS	Pre	5	**5.200**	**4.08656**	1.82757	.1259	10.2741	1-12
	During	8	**2.000**	**1.06904**	.37796	1.1063	2.8937	1-4
	Post	5	**1.200**	**.83666**	.37417	.1611	2.2389	0-2
	Total	18	**2.667**	**2.70076**	.63658	1.3236	4.0097	0-12

Table 11

ANOVA Results Comparing Mean Number of Conversations Reported by Student Participants Across Phases of the Study

		Sum of Squares	df	Mean Square	F	Sig.
SELF	Between Groups	1.603	2	.801	.644	.539
	Within Groups	18.675	15	1.245		
	Total	20.278	17			
PEERS	Between Groups	46.400	2	23.200	4.485	.030
	Within Groups	77.600	15	5.173		
	Total	124.000	17			

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5.714.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Multiple Comparisons							
Dependent Variable: Number Conversations Reported Scheffe							
	(I) PHASE	(J) PHASE	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
SELF	Pre	During	.4250	.6361	.803	-1.3012	2.1512
		Post	.8000	.7057	.540	-1.1151	2.7151
	During	Post	.3750	.6361	.842	-1.3512	2.1012
PEER	Pre	During	3.2000	1.2967	.078	-.3189	6.7189
		Post	4.0000*	1.4385	.044	.0962	7.9038
	During	Post	.8000	1.2967	.829	-2.7189	4.3189

*. The mean difference is significant at the 0.05 level.

Additionally, frequency data were compiled regarding items three and four of Survey 2, which asked the participants to list the topics and overall tone of each day's lunch conversations.

Topics of conversation were reported by the main participant and his lunch buddy each day and the tally of how often they were reported by each rater follows in Table 12. Topics appeared consistent across reporters and were similar overall and positive.

Table 12

Tally of Topics Reported by Student and Lunch Buddies Across All Three Phases of Study

Topics reported	SELF	LUNCH BUDDY
Cheese touch (game)	2	2
Did not remember	1	1
Favorite Games on Ipad	1	
Favorite Special	1	1
Football	1	
My Grandparent's names	1	
Rock, Paper, Scissors	7	3
Valentine's Day	1	1
Angry Birds on Ipad	0	1
Fun Things		1
Had Fun		3

Playing		1
playing, food		1
Rock, Paper, Scissors		
That Lunch buddy speaks another language	1	1
What they were eating		1
What we would play at recess		1

In order to assess the quality of lunch conversations more, lunch buddies and the main participant also selected a descriptor for the tone of each lunch's conversation in response to item 4 on Survey 2, which is located in Appendix B. Despite being given six options from which to select and a place to fill in other tones, the tally results showed the subject and his peers all selected "friendly" or "funny" as the tone of each day's lunch conversations.

Table 13

Frequency of Conversation Tones

	Response Option Selected	Frequency of Tone Rating	Percent
Self	Missing	2	11.1
	Funny	14	77.8
	Friendly	2	11.1
Lunch Buddy	Missing	2	11.1
	Funny	14	77.8
	Friendly	2	11.1

Finally, the perceptions of the social stories and the conversations between the subject and his peers were complied and described statistically. A breakdown of descriptive statistics by the main participant and his peers regarding their feelings about the usefulness of the social stories follows in Table 14. These were completed by the student each day of the intervention

and by peers on days that small groups were conducted. Response options ranged from 1 (not at all) to 5 (a lot).

Table 14

Descriptive Statistics for Student Ratings of Social Stories Intervention

(SURVEY 1: Student Perceptions of Social Stories)

Item	N	Mean	Range	Std. Deviation
1. Like social stories				
Subject	10	4.8000	4-5	.4216
Peers	6	4.8333	4-5	.4083
2. Help you converse				
Subject	10	4.9000	4-5	.3162
Peers	6	4.6667	4-5	.5164
3. Help peers converse at lunch				
Subject	10	4.9000	4-5	.3162
Peers	6	4.8333	4-5	.4083
4. Help you converse at centers				
Subject	10	5.0000	5-5	.0000
Peers	6	3.5000	2-5	1.2247

Results are discussed in the following chapter.

CHAPTER V

DISCUSSION

During the 2012-2013 school year, the researcher observed many challenges for a student with ASD. Through observations and interactions with the participant, there was clear evidence that this student demonstrated difficulties in initiating and maintaining conversations with peers during unstructured class times. Such struggles resulted in increased isolation for the student and difficulty forming strong peer relationships. After witnessing the struggles that this student faced

each day, it became more apparent that an intervention was necessary to assist him in developing the critical social skills that he lacked. The purpose of this study was to assess the effectiveness of using social stories interventions to improve these social skills.

The initial null hypotheses postulated that the mean frequency of conversations before, during, and after the social stories intervention in centers and at lunch times would be statistically equivalent. The hypothesis regarding center times was rejected as analyses of variance and follow-up testing revealed there was a statistically significant increase in the mean number of conversations that occurred from the pre to the post phase (from 1.8 to 3.6, $p < .019$). Analyses of variance did not indicate the mean frequency of conversations at lunch times differed significantly across the study phases during lunch times, and therefore the initial hypothesis regarding lunch times was retained.

The second set of null hypotheses regarding the frequency and quality of conversations also was retained. While the lunch buddies reported that more conversations took place during lunch than did the main participant (2.667 compared to 1.389 on average), t-test results indicated these means were not significantly statistically different. Interestingly, student reports indicated that the number of conversations occurring during lunch decreased from the pre to post phases of the study. While the goal was to increase conversations, this reduction in number of conversations, if correct, could be a result of the length of the students' conversations increasing, which might have resulted in fewer, but lengthier and hopefully more meaningful, conversations.

Observations at center times support the findings above which indicate the intervention did help increase the students' conversations. During center time, the main participant was observed initiating conversations more frequently and replying to students when they asked a question after the pre-intervention phase of the study. Examples of increased initiation of

conversation include the following. The participant was observed on several occasions asking peers to play a game with him and even inquiring if he was setting the game up correctly. In addition, he was observed on occasion inquiring about the personal lives of peers in the class, one example being that he asked a female classmate about her new baby sister. Further observations indicated that the participant tended to speak more frequently with boys and often conversed with the same peers during center times each day.

The observations during lunch reflected the data collected from the participant and the peer participants. The student and his classmates were observed conversing but also had to ensure that they had enough time to focus on eating their lunch. Many of the conservations reported by the students and which were observed focused on games such as "rock, paper, scissors" or "cheese touch" which is a game where students touch each other on the arm and say, "cheese touch." Other age-appropriate topics such as what the participants were going to play at recess also were reported and recurrent throughout the study.

Survey responses indicated that all of the students enjoyed the social stories. Students' ratings for each story were fours or fives on a rating scale which ranged from one (they did not like the story at all) to five (they liked it a lot). Both the participant and his peers reported that they felt that the stories helped them converse at lunch. The main participant's ratings suggested that he felt more strongly than his peers that the stories helped him engage in conversations during centers. This could be a result of the fact that the peers only participated in the social stories during a lunch bunch and thus may have been more focused on applying the new knowledge at lunch. The main participant had the intervention delivered both during lunch and center times, which may have resulted in him finding the skills more useful at centers than his peers.

Limitations

Several limitations may have affected the results and conclusions of the study. The sample size of one may have been too small to determine accurately the effectiveness of the intervention or to generalize the findings to other students with ASD. Future studies could be conducted with a larger sample to determine how social stories interventions might affect a variety of students with ASD in different settings.

The time frame of the study was short, which may have reduced the effect of the intervention. It would be beneficial for future studies to extend over a longer period of time to ensure that the participant(s) have more time to practice applying the skills taught via the social stories and to allow for a more in-depth examination of their effectiveness and whether and for how long any effects last.

One threat to the validity of the study was the duration of the time interval the classroom teacher and aide used to observe whether or not the student was engaged in conversations. There were several occasions when the researcher observed the subject and noted he was not engaged in conversation. However, the subject was seen to be engaged in conversations at times other than at the ten minute marks at which time the conversational behavior was recorded as occurring or not. Therefore, more conversations could have taken place than were reported. Future studies might benefit from using an actual frequency count or shorter interval of time to observe and record conversations' occurrence.

Another threat to the validity of the results was that on several occasions during lunch, the lights were turned off by staff as a signal to students lower the volume in the cafeteria. During these times, the subject was not permitted to engage in conversation. This situation could

have resulted in a lower number of conversations taking place or being observed than would have occurred had the lights remained on.

The perceptions provided by the students also may have affected the results of the study. On many occasions, the reports of the student and his peers regarding the numbers of their conversations differed from each other and from the number observed by the researcher. The student and peer participants also endorsed only two choices for the tone of the conversations, friendly or funny, even though they had six options from which to choose. Given their young age, their ability to accurately characterize the tone of their conversations or understand the options on the survey unintentionally may have yielded inaccurate results.

A final threat to validity may be that the student only engaged in conversations at lunch with three different peers, all of whom were the same gender as the subject. The fact that his interactions were limited to only these familiar same-sex peers might suggest that he was comfortable with them already and that he may have interacted with them without the intervention, especially as the frequency of lunch conversations did not change significantly across the phases of the study. Future studies might benefit from randomly assigning a variety of peers to be lunch buddies and participate in the social stories intervention to learn if the frequency and quality of interactions with peers varies across levels of the subject's familiarity with the peer participants.

Relationship to Other Research

The research was similar to a study conducted by Harjusola-Webb et al. (2012) in which social stories were used as an intervention to increase social interactions. Both studies measured the frequency of conversations. However, the current research only examined the use of this intervention whereas the research conducted by Harjusola-Webb et al. found that the social skills

increased most when social stories were combined with another intervention called peer-mediated interventions. This intervention focuses on using classmates as role models for students with ASD.

The study reported in this paper also relates to research conducted by Denning (2007) which found it difficult to determine if changes in behavior were directly linked to the use of social stories as an intervention. The study reported in this paper showed significant changes in the frequency of conversations that occurred during center time, but not during lunch. Because of these findings, it is more difficult to determine if the increase during centers was a result of the intervention. Both studies also suggest that using the intervention over a longer period of time may have provided more accurate results.

Implications for Future Research

Given the incidence of ASD and the social and emotional challenges children with ASD often experience, future research should be conducted to learn more about effective interventions to improve their social skills and adjustment. It might be more beneficial to begin studies such as this one at the start of the school year and run lunch bunch groups or other interventions throughout a greater portion of the school year. This increased time would allow participants more opportunity for skill development as well as for development of familiarity and comfort among classmates, which could foster positive interactions with and without support. A longer duration of study also would allow researchers to determine more accurately whether or not the interventions of interest are successful and gains are maintained. Data could be compared from the start and end of the school year to measure student growth and skill retention and generalization.

It also would be beneficial to conduct future studies using larger samples. The intervention could be provided to all students with disorders on the autism spectrum within a school. Another option would be to use the social stories with entire classes in which some students with ASD are enrolled. The researcher could then assess the impact and perceptions of the intervention on overall classroom dynamics as well as the social skills of the student(s) with ASD.

The results of this study provide a stepping stone to understanding how social stories interventions impact social skills of students with ASD. The increase in the frequency of conversations during center times may indicate that the results of using social stories are different at certain times in the school day. As noted, future methodological changes, including a longer study, might show more fully whether and how social stories impact the social skills and interactions and the perceptions of them of children with ASD and their peers. Educators, children with ASD, and their peers would benefit from continued study about how to maximize the gains from using social stories and related interventions in the classroom.

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APPENDIX A

SURVEY 1

Student Perceptions of Social Stories

To be completed by all students who hear the social stories on days that I do small group and the subject every day.

1. Did you like the social story? Why/Why not?
   1= not at all
   2=not really
   3= not sure
   4= pretty well
   5= a lot

2. Do you think the social story helped you have conversations with your classmates?
   1= not at all
   2= not really
   3= not sure
   4= pretty well
   5= a lot

3. Do you think the social story helped you or your peers in the lunch group have better conversations?
   1= not at all
   2= not really
   3= not sure
   4= pretty well
   5= a lot

4. Do you think the social story helped you talk to your peers at centers?
   1= not at all
   2= a little
   3= not sure
   4= pretty well
   5= a lot

5. What did you learn from the social story?

APPENDIX B

SURVEY 2

Daily Survey for Student and Lunch Buddy

1. How many conversations did you engage in with your lunch buddy?
2. How many of those did YOU start?
3. List the topics you talked about.
4. Circle the word that best describes the tone of your overall conversations?

   A. Friendly

   B. Funny

   C. Helping me

   D. Helping buddy

   E. Helping someone else (not my buddy or me)

   F. Arguing

   G. Other (fill in_____)