Stay-Play-Talk with Preschoolers: Programming for Generalization and Maintenance

By

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To ‘the originals,’ Jim, Tara, Jaime, Caroline, and Ali, for supporting me every step of the way.

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CHAPTER I

INTRODUCTION

Peer-mediated (PM) interventions, a recommended practice in the field of early childhood special education (Division for Early Childhood, 2014), involve adults training peers who are typically developing (peer buddies) to interact and implement interventions with children who are at risk for or have developmental delays (target children; Odom & Strain, 1984). In previous research, peer buddies have learned to use the strategies with training and support from adults (Strain & Fox, 1981; Strain & Kohler, 1998; Strain & Odom, 1986). PM interventions have been shown to be effective for improving target children's social and communication behaviors (Kohler & Strain, 1999; Kohler, Strain, & Goldstein, 2005). One specific PM intervention is stay-play-talk (SPT; English, Goldstein, Shafer, & Kaczmarek, 1997; Goldstein, English, Shafer, & Kaczmarek,1997; Hughett, Kohler, & Raschke, 2013). In SPT, peer buddies are taught to maintain proximity, establish mutual attention by suggesting a play activity, and talk about the ongoing activity (English et al., 1997). SPT also involves teaching peer buddies to acknowledge target children's communicative behaviors and attempts (Goldstein et al., 1997).

Although there have been many PM intervention studies conducted with preschoolers (e.g., Fantuzzo et al., 1987; Goldstein, Wickstrom, Hoyson, Jamieson, & Odom, 1988; Sainato, Goldstein, & Strain, 1992; Stanton-Chapman & Brown, 2015), there have only been four published studies examining the effectiveness of SPT with preschool children (English et al., 1997; Goldstein et al.,1997; Hughett et al., 2013; Kohler et al., 2007). Across these studies, 16

target children ranging in age from 40-64 months participated. Identified disabilities in target children included: developmental delays, Down syndrome, language delays, social delays, and autism. In addition, 26 peer buddies participated across the four studies. In the one study that reported information on peer buddies' age, the average age of peer buddies was 48 months (Kohler et al., 2007). Studies reported pairing one target child with one peer buddy (English et al., 1997; Goldstein et al., 1997) or pairing one target child with two peer buddies (Hughett et al., 2013; Kohler et al., 2007) during the intervention. Half of the studies reported that the grouping of target children and peer buddies remained consistent throughout the intervention (Goldstein et al., 1997; Hughett et al., 2013), with the other half of studies reporting the target children were paired with different peer buddies over the course of the study (English et al., 1997; Kohler et al., 2007).

In the majority of the SPT studies, both peer buddies and target children were included in the training, although the target children were only involved to provide peer buddies with authentic opportunities to practice (English et al., 1997; Hughett et al., 2013; Kohler et al., 2007). Training was generally implemented in an unoccupied room outside of the participants' classroom (English et al., 1997; Goldstein et al., 1997). The adult who provided training varied across studies, with a member of the classroom staff implementing SPT training in two studies (Hughett et al., 2013; Kohler et al., 2007) and a researcher implementing training in one study (English et al., 1997). Goldstein and colleagues (1997) did not report information on who implemented training. Trainers implemented a variety of strategies to train the peer buddies including discussion, modeling, practice, and prompting. Visuals were also used in the majority of studies (Goldstein et al., 1997; Hughett et al., 2013; Kohler et al., 2007). One study reported using praise as feedback during training sessions (Kohler et al., 2007).

During intervention sessions (i.e., settings/activities in which the peer buddies were expected to implement the SPT strategies learned during the training sessions), studies reported various levels of adult involvement. The majority of studies included adult prompts for the peer buddies during intervention sessions (Goldstein et al., 1997; Hughett et al., 2013; Kohler et al., 2007) and all of the studies implemented some type of feedback procedure (i.e., correction, praise, tangibles). Two studies also discussed the strategies and expectations with the peer buddies at the beginning of the intervention sessions (English et al., 1997; Goldstein et al., 1997). The majority of the studies also used visuals during intervention sessions (Goldstein et al., 1997; Hughett et al., 2013; Kohler et al., 2007). A member of the classroom staff was involved in the majority of SPT studies (English et al.; Hughett et al., 2013; Kohler et al., 2007). However, Goldstein and colleagues (1997) reported that a researcher was the only adult who provided support, and English and colleagues (1997) reported that both a researcher and member of the classroom staff were involved during intervention sessions. In the studies that reported sufficient information to determine the location of the intervention sessions, intervention sessions were implemented in the target children and peer buddies' classroom (English et al., 1997; Goldstein et al., 1997).

Information on adult and peer buddy implementation of the SPT intervention was limited. None of the SPT studies reported information on the fidelity with which the adults implemented procedures during training. In addition, adult's adherence to procedures during intervention sessions was not adequately reported. The majority of the studies reported the number of prompts adults provided to the target children and peer buddies but did not measure whether those prompts followed study procedures in terms of how often and what type of prompts were given. Another level of procedural fidelity in PM studies is the examination of peer buddies'

implementation of strategies with target children, which was not examined in the SPT studies. Studies examined if peer buddies' social and communication behaviors increased but did not measure whether peer buddies used the trained SPT strategies with target children.

To examine the effects of SPT, three studies used a multiple baseline design (English et al., 1997; Hughett et al., 2013; Kohler et al., 2007) and one used a multiple probe design (Goldstein et al., 1997). A functional relation between the SPT intervention and target children and peer buddies' social and communicative behaviors was demonstrated in all SPT studies. In each study, there was at least one demonstration and two replications of effects. However, the magnitude of effects was weak in the Kohler et al. (2007) study, with only a slight increase in the level of participant behavior, and overlap between baseline and intervention conditions occurring in two of the three tiers. Maintenance was measured in two studies (Hughett et al., 2013; Kohler et al., 2007). Maintenance was strong in Hughett and colleagues' (2013) study; one demonstration and two replications of maintenance effects were observed for target children. Maintenance data remained at intervention levels, followed the same increasing trend as intervention data, and did not overlap with baseline data. Each demonstration had more than three data points (Hughett et al., 2013). In the Kohler and colleagues (2007) study, maintenance effects were mixed, with data overlapping with baseline data in two of the three tiers. Generalization across trained peer buddies was measured in one study, and effects were unclear due to the limited amount of data (Goldstein et al., 1997).

There are a number of limitations with the SPT studies. First, there is a limited number of published SPT studies with preschool children. More research is needed on SPT to determine if SPT is an evidence-based practice. Second, implementation fidelity was either not reported or

not adequately examined. Finally, generalization and maintenance effects were either not measured or weak in the majority of SPT studies.

To address these limitations, a study was conducted to evaluate the efficacy of SPT for preschoolers (Milam, Hemmeter, & Barton, 2018). The purpose of the study was to replicate the effects of previous SPT studies in increasing target children's play engagement and initiations and responses. Another purpose was to examine procedural fidelity at each level of the SPT intervention: adult's implementation of training procedures, adult's implementation of procedures during intervention sessions, and peers' implementation of the strategies with target children. The final purpose was to measure generalization and maintenance of target children and peer buddies' behavior.

Six peer buddies and three target children participated in the study. During three 20-min training sessions, peer buddies were taught to implement the SPT strategies with the target child in their classroom. Following training, a system-of-least prompts (SLP) procedure was implemented with peer buddies if they were not implementing the SPT strategies with target children during the 10-min intervention sessions. The effects of SPT on the behavior of target children and peer buddies were examined using a multiple-probe design.

The adults implemented the training and SLP with fidelity, and peer buddies implemented the SPT strategies with target children with fidelity. Furthermore, SPT was effective in increasing target children's engagement in play and their initiations and responses. During the fading of the intervention procedures and maintenance sessions (which occurred in the same activity as intervention sessions), peer buddies continued to implement the SPT strategies with target children. Target children also continued to initiate and respond at intervention levels. However, peer buddies did not generalize the use of the SPT strategies to

other activities. In addition, generalization and maintenance effects for target children were mixed. There was evidence that two of the three target children's engagement in play generalized to other children and activities. For two out of three target children, engagement in play also maintained, remaining at intervention levels. Target children's initiations and responses generalized to other children in the class; however, target children did not initiate and respond to peer buddies in other activities. While the study addressed the implementation fidelity limitations from previous studies, more research is needed to improve the effects on generalization and maintenance of behaviors of interest.

Purpose

The purpose of the current study was to replicate the previous study (Milam et al., 2018) with the addition of specific strategies designed to program for generalization and maintenance of skills for both peer buddies and target children. To address generalization and maintenance, the following procedures were added or revised: (a) in addition to individual training sessions with the peer buddies and target children (triad training sessions), lessons on using SPT were conducted during a whole class activity; (b) the importance of using the SPT strategies across the day was discussed during both whole class and triad training sessions; (c) examples of how peers could use the strategies across the day were provided during both whole class and triad training sessions; (d) the teacher was involved during whole class training sessions; and (e) the teacher provided whole class reminders to use the SPT strategies during all intervention, generalization, and maintenance buddy sessions.

This study addressed the following research questions to replicate and extend findings from previous research on SPT:

1. With adult support (i.e., training and SLP), can peer buddies implement the SPT strategies with target children during free play with fidelity?
2. Is the training and SLP effective in increasing peer buddies' generalization and maintenance of SPT strategy use with fidelity across children and settings?
3. Is SPT delivered with fidelity by peer buddies effective in increasing target children's engagement during free play?
4. Is SPT delivered with fidelity by peer buddies effective in increasing target children's initiations and responses during free play?
5. Is SPT delivered with fidelity by peer buddies effective in increasing target children's generalization and maintenance of play engagement and initiations and responses across children and settings?
6. Is SPT delivered with fidelity by peer buddies effective in increasing class-wide social engagement of children?
7. Do teachers view SPT as a socially valid intervention?
8. Does SPT delivered with fidelity by peer buddies produce socially significant changes in target children's social engagement with classmates?

CHAPTER II

METHODS

Recruitment

After receiving approval from the Vanderbilt Institutional Review Board, the researcher contacted a local childcare center and met with the director to explain the study purpose and procedures. The childcare director then set up a meeting with the researcher and teachers who had children who met the age inclusion criterion. The researcher provided an overview of the study and discussed target child and peer buddy inclusion criteria to determine if there were children the teachers would nominate for participation. Four teachers in the childcare center were interested in participating and indicated they had children in the class who would meet inclusion criteria. All four teachers were asked to nominate a target child and two peer buddies and send home child consent forms. Once parents provided written consent, eligibility for participation was confirmed through observations of the target child and peer buddies.

Once it was confirmed that one target child and two peer buddies in each of the four classrooms met inclusion criteria, each teacher was asked to send consent forms home for the rest of the students in the class. These forms asked for consent to video record, as well as consent to participate in sociometric rating activities. Once parent consent was provided for each child in the class, pictures of the individual children were taken for use during the sociometric rating activity. Parents of one child in each of the three classrooms did not provide consent. These three children were blurred in all videos and were not included in the sociometric rating activity.

Participants

Four early childhood teachers and their students participated in the study. One target child and two peer buddies participated in each teacher's classroom, for a total of 12 child participants (i.e., four target children and eight peer buddies) across the four classrooms. All participants provided consent or assent prior to beginning the study. See Table 1 for teacher information, Table 2 for child demographics, and Table 3 for child assessment scores.

Teacher participant inclusion criteria. Four teachers from four different classrooms participated in the study. Inclusion criteria were: (a) willingness to support the SPT intervention in the classroom, and (b) have a group of children in their classroom who met the inclusion criteria.

Target child inclusion criteria. Four target children participated in the study. Target child participants met the following inclusion criteria: (a) at least 36 months of age, (b) history of consistent attendance (i.e., 6 or fewer absences in the last 30 days based on teacher report), and (c) social delays identified by teacher nomination and confirmed through researcher observation. Teachers were asked to nominate children in their classroom who were quiet and rarely talked or played with peers (see Appendix A). Three 10-min observations of the nominated child were conducted by the researcher during free play to confirm that the child talked to peers three or fewer times per observation (see Appendix B).

Peer buddy inclusion criteria. Two peer buddies were identified for each target child to participate in the study. Peer buddies met the following inclusion criteria: (a) at least 36 months of age, (b) history of consistent attendance (i.e., 6 or fewer absences in the last 30 days based on teacher report), (c) talk to peers frequently (i.e., at least .5 per minute on average across 3 observations), and (d) attend for at least five minutes during small and large group lessons.

Teachers were asked to nominate children in their classroom who talked to peers frequently, were able to sit for at least five minutes during small and large group lessons, and were likely to play in the same types of activities (with similar toys, in similar ways) as the target child (see Appendix C). Information provided by teachers about peer buddies who were likely to play in the same types of activities as the target child was used to match the target child to peer buddies. The researcher then conducted three 10-min observations of the nominated children during free play to confirm that the children talked to peers frequently as well as three observations during small and large group activities to confirm that the children attended for at least five minutes (see Appendix D).

Classroom 1. Ms. Sarah was the teacher in the first classroom (see Table 1). Lila participated as the target child, and Taisha and Kayla participated as peer buddies in Ms. Sarah's class. Ninety-five percent of children in Ms. Sarah's class were African-American and 5% were Caucasian. Ms. Sarah was a 41-year-old African-American female who had 17 years of experience working with young children. Ms. Sarah had a teaching certification for pre-kindergarten through third grade. She had been working in her current position for one year at the start of the study.

Lila was a 49-month-old African-American female. She received a Mullen Scales of Early Learning, AGS Edition (Mullen, 1995) Early Learning Composite (ELC) score in the 21st percentile and age equivalency scores of 42 and 44 months on the Mullen expressive and receptive language scales, respectively (see Table 3). Based on teacher rating, Lila was identified as having well-below average social skills and exhibiting average problem behavior on the Social Skills Improvement System (SSIS; Gresham & Elliott, 2008). She received a score of 100 on the Ages and Stages Questionnaires: Social Emotional, Second Edition (ASQ:SE-2;

Squires, Bricker, & Twombly, 2015), indicating that she should be referred for further assessment. Based on teacher report and researcher observation, Lila often engaged in solitary play with puzzles and other table toy manipulates such as peg boards and links. On two occasions, Lila was observed moving to a new activity when peers approached and began playing near her. Lila never initiated interactions with other children, and, when peers occasionally initiated to Lila, she did not respond. She was observed frequently engaging in extended interactions with an adult volunteer at the writing center. Lila rarely initiated to adults but would respond when an adult asked her a direct question.

Taisha and Kayla participated as Lila's peer buddies. Taisha was a 54-month-old African-American female. She received a ELC score in the 50th percentile. In addition, she received age equivalency scores of 45 and 55 months on the expressive and receptive language scales of the Mullen, respectively. Based on teacher rating, Taisha was identified as having average social skills and exhibiting average problem behavior on the SSIS. She received a score of 20 on the ASQ:SE-2. Taisha's teacher reported she often engaged in pretend play with objects (e.g., pretending a block was a car, pretending a shoelace was a spider). The researcher observed her interacting with other children in the class by pretending to be on a helicopter ride with them. She was also observed playing cooperatively with peers; she approached a peer and asked if she could help him complete his puzzle. Taisha was very talkative and was observed initiating and responding to a variety of peers.

Kayla, Lila's other peer buddy, was a 59-month-old Caucasian female. She received a Mullen ELC score in the 10th percentile and received age equivalency scores of 51 and 47 months on the Mullen expressive and receptive language scales, respectively. Based on teacher rating, Kayla was identified as having above average social skills and exhibiting average

problem behavior on the SSIS. She received a score of 0 on the ASQ:SE-2. Kayla was frequently observed engaging in play with groups of children and directing other children's play. She played cooperatively using pretend play skills in the dramatic play center, as well as with table toy manipulatives with multiple children. Kayla's teacher reported she talked frequently to a variety of children and often approached children who were upset and tried to comfort them.

Classroom 2. Ms. Tasha was the teacher in the second classroom. Anna participated as the target child, and Robert and Leilani participated as peer buddies in Ms. Tasha's class. All of the children in Ms. Tasha's class were African-American. Ms. Tasha was a 31-year-old African-American female who had seven years of experience working with young children and had been in her current position for one month at the start of the study. She did not have a teaching certification.

Anna was a 49-month-old African-American female. She received a Mullen ELC score in the 1st percentile and age equivalency scores of 37 and 36 months on the Mullen expressive and receptive language scales, respectively. Based on teacher rating, Anna was identified as having below average social skills and exhibiting average problem behavior on the SSIS. She received a score of 150 on the ASQ:SE-2, indicating that she should be referred for further assessment. Based on researcher observation, Anna often wandered around the room watching her peers play during center time. When she played, she engaged in solitary play with table toy manipulatives such as pegs, tiles, Lincoln logs, and links. Anna engaged with these materials by lining them up and spent long amounts of time making slight adjustments to ensure the materials were in a straight line. She was never observed initiating to peers, and Anna's peers were never observed initiating to her. Based on teacher report, Anna would initiate conversations with adults, but

these initiations were rare. Her teacher also reported that Anna often seemed fearful and would cry frequently, although her teacher was not able to determine the cause.

Robert and Leilani participated as Anna's peer buddies. Robert was a 59-month-old African-American male. He received a Mullen ELC score in the 1st percentile and age equivalency scores of 37 and 44 months on the Mullen expressive and receptive language scales, respectively. Based on teacher rating, Robert was identified as having well-below average social skills and exhibiting well-above average problem behavior on the SSIS. He received a score of 60 on the ASQ:SE-2. Although Robert's teacher rated him as having well below average social skills on the SSIS, Robert was included as a peer buddy because the researcher often observed Anna watching Robert play with other children and following Robert around the room. In addition, through researcher observation and teacher report, it was determined that Robert frequently engaged in cooperative play with peers. He was observed in the dramatic play center with a group of three girls engaging in extended pretend play interactions. He was also observed engaging in an extended interaction with a group of boys making music and singing with musical instruments. Robert frequently initiated and responded to both adults and peers. Robert's teacher reported that he engaged in challenging behavior in the form of hitting and yelling at another one of the boys in the class. However, she reported that this challenging behavior was typically instigated by the other boy.

Leilani, Anna's other peer buddy, was a 57-month-old African-American female. She received a Mullen ELC score in the 8th percentile and age equivalency scores of 48 and 39 months on the Mullen expressive and receptive language scales, respectively. Based on teacher rating, Leilani was identified as having average social skills and exhibiting average problem behavior on the SSIS. She received a score of 15 on the ASQ:SE-2. Leilani was observed on

numerous occasions engaging in cooperative play with a group of girls. She would frequently initiate and successfully direct these play interactions. She was typically observed playing in the dramatic play center as well as engaging in dramatic play with table toy manipulatives (e.g., using tiles to make houses for small bear counters). Leilani initiated and responded frequently to both adults and peers and peers frequently initiated conversations with Leilani.

Classroom 3. Ms. Elaine was the teacher in the third classroom. Hunter participated as the target child, and Eli and Jakobe participated as peer buddies in Ms. Elaine's class. All of the children in Ms. Elaine's class were African-American. Ms. Elaine was a 63-year-old African-American female who had been working in her current position for 17 years and had 30 years of experience working with young children. She had an associate's degree in child development.

Hunter was a 53-month-old African-American male. He received a Mullen ELC score in the 8th percentile and age equivalency scores of 42 and 47 months on the Mullen expressive and receptive language scales, respectively. Based on teacher rating, Hunter was identified as having well-below average social skills and exhibiting above average problem behavior on the SSIS. He received a score of 125 on the ASQ:SE-2, indicating that he should be referred for further assessment. Based on teacher report and researcher observation, Hunter often engaged in solitary play with blocks, playdough, and with materials in the science center. When given a choice of where to play, Hunter would choose to play in a center by himself. On one occasion when another child approached and began playing in the same center, Hunter and the peer were observed pulling toys away from each other and arguing. The researcher also observed Hunter having negative interactions with peers. Typically, this would begin with a peer approaching and taking a toy from Hunter. He would respond by crying and protesting, but these responses were

ignored by the peers. He was observed talking to himself in a quiet voice and frequently initiated conversations with adults, but he rarely initiated conversations with peers.

Eli and Jakobe participated as Hunter's peer buddies. Eli was a 56-month-old African-American male. He received a Mullen ELC score in the 66th percentile and age equivalency scores of 53 and 59 months on the expressive and receptive language scales, respectively. Based on teacher rating, Eli was identified as having average social skills and exhibiting average problem behavior on the SSIS. He received a score of 0 on the ASQ:SE-2. Eli was observed playing cooperatively with other children to build houses and towers from his favorite television show. Eli's teacher reported that he typically played with other boys, but the researcher observed him responding to initiations from girls as well. He talked frequently with adults and initiated and directed conversations with peers, often talking about his own areas of interest (i.e., his favorite television show.)

Jakobe, Hunter's other peer buddy, was a 59-month-old African-American male. He received a Mullen ELC score in the 18th percentile and age equivalency scores of 50 and 53 months on the expressive and receptive language scales, respectively. Based on teacher rating, Jakobe was identified as having below average social skills and exhibiting well-above average problem behavior on the SSIS. He received a score of 90 on the ASQ:SE-2, indicating his social-emotional skills should continue to be monitored. Based on teacher report and researcher observation, Jakobe engaged in cooperative play with a variety of peers in a variety of centers. He followed other children's lead, engaging in whatever activity the other child chose. He was observed engaging in cooperative pretend play activities in the science center, dramatic play center, and block center. Although he initiated and responded to both adults and peers, he was more often observed responding to peers' initiations to him, which occurred frequently.

Classroom 4. Ms. Becky was the teacher in the fourth classroom. Caleb participated as the target child, and Alyssa and Pierce participated as peer buddies. Ninety-five percent of children in Ms. Becky's class were African-American and 5% of were Hispanic/Latino. Ms. Becky was a 60-year-old African American female. She had 38 years of experience working with young children and had been in her current position for 33 years. She had an associate's degree in administration.

Caleb was a 45-month-old African-American male. He received a Mullen ELC score in the 38th percentile and age equivalency scores of 35 and 31 months on the Mullen expressive and receptive language scales, respectively. Based on teacher rating, Caleb was identified as having below average social skills and exhibiting average problem behavior on the SSIS. He received a score of 30 on the ASQ:SE-2. During pre-baseline observations conducted by the researcher, Caleb was observed engaging in solitary play with puzzles and other table toy manipulatives. He was observed responding to adults and having extended interactions with his teacher. He was not observed initiating to other children, and children did not initiate interactions with him.

Alyssa and Pierce participated as Caleb's peer buddies. Alyssa was a 47-month-old African-American female. She received a Mullen ELC score in the 6th percentile and age equivalency scores of 45 and 37 months on the Mullen expressive and receptive language scales, respectively. Based on teacher rating, Alyssa was identified as having average social skills and exhibiting average problem behavior on the SSIS. She received a score of 20 on the ASQ:SE-2. Based on teacher report, Alyssa frequently played cooperatively with a variety of peers. During observations, she played with Mr. Potato Head and puzzles with a peer and drew pictures in art center with four other peers. Alyssa spoke quietly but was observed initiating and responding to peers during play and responding to adult initiations.

Pierce, Caleb's other peer buddy, was a 47-month-old African-American male. He received a Mullen ELC score in the 13th percentile and age equivalency scores of 40 and 37 months on the expressive and receptive language scales, respectively. Based on teacher rating, Pierce was identified as having below average social skills and exhibiting average problem behavior on the SSIS. He received a score of 20 on the ASQ:SE-2. Based on teacher report and researcher observation, Pierce frequently played cooperatively with peers building with blocks and making tracks for cars. He was also observed during multiple observations building towers and houses with Legos at the table. He was not observed talking to adults, but he initiated and responded to other children in the class frequently.

Setting

This study was implemented in a childcare center serving children and families with low socio-economic status in a large city in a southeastern state. Ninety-three percent of children were African-American, 4% were Multiracial, 2% were Caucasian, and 1% were Hispanic/Latino. Whole class training sessions were conducted in the classroom in the area in which large group lessons typically occurred. Triad training sessions (i.e., target child and peer buddies) occurred in the classroom when the other children were not present in the room. During the triad training sessions, the class was outside for recess or in another area of the center where children could engage in indoor gross motor activities. Intervention sessions, which will be referred to as *buddy time*, occurred in the children's classroom during free play when all children were present. Children had access to all available classroom centers and were able to move around the room freely. Generalization sessions occurred outside for the triads from classroom 1 and classroom 2 because a second free play activity did not occur in the classroom. The outside area was a playground with multiple slides and tubes to climb through, large areas for running,

and swings. Generalization sessions occurred in the classroom during an afternoon free play for the triad from classroom 3.

Materials

Peer buddies and target children had access to all materials present in the classroom during buddy time. Training protocols, SPT visuals, a visual timer, a prize box, and data collection forms were used during study implementation.

Training protocols. Eight different training protocols were developed and followed, one for each of the SPT whole class training sessions (see Appendix E) and one for each of the triad training sessions (see Appendix F). In addition, two booster session protocols were developed, one for a whole class booster session and one for a triad booster session (see Appendix G). SPT visuals, described below, were used during all training sessions.

SPT visuals. Three different types of visuals were used during the study: (a) a scripted story, (b) visuals representing the SPT strategies, and (c) a SPT checklist (see Appendix H).

Scripted story. A scripted story, written for the study, was read to children at the beginning of each whole class training session and at the beginning of each triad training session. The purpose of the scripted story was to introduce the SPT strategies and remind children of the importance of friends and playing with friends who might be lonely.

Visuals representing the SPT strategies. Child-friendly visuals representing the SPT strategies were introduced to the children during both the whole class training sessions and the triad training session. These visuals were also referred to during buddy time. The three visuals were color, laminated, and 6 x 6 in. in size. Smaller copies (i.e., 2 x 2 in.) of the visuals were also used and were stored on a 1 in. ring. During buddy time, the large visuals were posted at child level in an area of the classroom used frequently by the peer buddies and target children. The

smaller visuals were used during group and triad training sessions to quickly refer to the visuals. The smaller visuals were also used as part of the system-of-least prompts during buddy time.

SPT checklist. A checklist with each of the three strategies was used with peer buddies before and immediately after buddy time. The SPT checklist provided clear instructions for the peer buddy prior to buddy time and feedback to the peer buddy following buddy time. The SPT checklist was laminated, and a dry-erase marker was used to check off the strategies observed during buddy time. Peer buddies were reminded of the three strategies before buddy time began. Following buddy time, the SPT checklist was reviewed with the peer buddy to determine if the peer buddy earned a prize.

Visual timer. A visual timer was used during buddy time as a signal to the peer buddy at the beginning and end of buddy time.

Prize box. If a peer buddy received a check for each of the three strategies on the SPT checklist, s/he chose a small prize out of the prize box. The prize box contained small reinforcing items or pictures signifying reinforcing activities (e.g. small toy cars, superhero figures, bouncy balls, pictures of a game to be played later, etc.). The researcher asked the teacher for information on peer buddy preferences when selecting items for the prize box.

Data collection materials. A Canon HD Camcorder was used to record 10-min samples of peer buddy and target child behavior during baseline, intervention, generalization, and maintenance sessions. The camcorder was mounted on a tripod. Paper and pencil data collection forms were used to record the peer buddy's implementation of the SPT strategies (see Appendix I), the duration of target child play (see Appendix J), and class-wide social engagement (see Appendix L). Target child initiations and responses were coded using the Multi-Option

Observation System for Experimental Studies (MOOSES; Tapp, Wehby, & Ellis, 1995) on a Dell Latitude ST touch screen tablet (see Appendix K).

Response Definitions and Data Collection

Peer buddy implementation of the SPT strategies. See Appendix I for detailed codes for the peer buddy's implementation of the SPT strategies, including examples, non-examples, and decision rules, and for the associated data collection form.

Response definitions. Each response definition related to the peer buddies' implementation of the SPT strategies is defined below.

Stay. Stay was defined as the peer buddy being in the same center or area of the classroom as the target child. If a center area was not clearly defined in the classroom, stay was defined as the peer buddy being within 3 feet of the target child. For generalization sessions that occurred outside, the decision was made to extend this distance to 6 ft. so children were considered to be playing if they were playing tag or other outdoor activities.

Play. Play was defined as the peer buddy engaging in parallel, associative, or cooperative play with the target child. Parten's (1932) definitions of parallel, associative, and cooperative play were used to define play in this study. Examples of the peer buddy playing with the target child included: (a) the peer buddy engaging with the same type of toy as the target child in the same way; (b) the peer buddy playing with a different toy than the target child, but in the same or similar way; (c) the peer buddy and target child engaging with toys within the same play scheme; (d) the peer buddy sharing and exchanging toys with the target child; or (e) the peer buddy engaging in similar actions during outdoor play as the target child (e.g., going down the slide, running with the target child, swinging next to the target child). Onlooker or solitary independent play was not included in this definition of play (Parten, 1932).

Talk. Talk was defined as the peer buddy engaging in communicative attempts directed to the target child. Examples of communicative attempts included, but are not limited to: a greeting to the target child, asking the target child a question, requesting toys/items/or information from the target child, commenting on something the target child was doing, or responding to a comment or question from the target child.

Data collection. The peer buddy's implementation of the SPT strategies was coded via video by (1) recording the duration of when the stay and play response definitions were met, and (2) recording examples of peer buddy communicative attempts directed to the target child.

Duration of the stay-play-talk episode began as soon as the peer buddy met the definitions for stay and play and ended when the peer buddy no longer met the definitions for stay and play. During the time that the peer buddy was coded as meeting the stay and play definitions, the observer recorded examples of peer buddy talk directed toward the target child. If two examples of peer buddy talk occurred during the time the peer buddy met the stay and play definitions, a complete SPT episode was coded. The primary dependent variable, the total duration of peer buddy strategy use, was calculated by summing the duration of each complete SPT episode. If two examples of peer buddy talk directed toward the target child were not observed during the time the peer buddy was coded as meeting the stay and play definitions, a complete episode did not occur and the episode duration was not included in the total duration of peer buddy strategy use. The observer also recorded the level of support the peer buddy needed for each strategy (i.e., stay, play, and talk).

Target child engagement in play. See Appendix J for detailed codes for target child engagement in play, including examples, non-examples, and decision rules, and for the associated data collection form.

Response Definitions. Each response definition related to target child engagement in play is defined below.

Play. Target child play was defined in the same way as peer buddy play. Play was defined as the target child engaging in parallel, associative, or cooperative play with the peer buddies or other children in the classroom. Parten's (1932) definitions of parallel, associative, and cooperative play was used to define play. Examples of the target child playing included: (a) the target child engaging with the same type of toy as another child in the same way; (b) the target child playing with a different toy than another child, but in the same or similar way; (c) the target child and another child engaging with toys within the same play scheme; (d) the target child sharing and exchanging toys with another child; (e) or the target child engaging in similar actions during outdoor play as the peer buddy or other children (e.g., going down the slide, running with another child, swinging next to the peer buddy or another child). Onlooker or solitary independent play was not included in this definition of play (Parten, 1932).

Number of children the target child played with. The number of children the target child played with was also recorded during the duration of the target child's play. Again, play was defined at the target child engaging in parallel, associative, or cooperative play with the peer buddy or other children in the classroom (Parten, 1932). This number included the peer buddy, if present, but did not include the target child. The number of children the target child was playing with was recorded to determine if the play group the target child engaged with increased with implementation of the intervention.

Peer buddy playing. Peer buddy playing was defined as the peer buddy playing (i.e., engaging in parallel, associative, or cooperative play) with the target child as part of the play group (Parten, 1932). Whether either peer buddy was part of the play group the target child was

engaging with was recorded to determine if the target child was primarily playing with the trained peer buddies or if the target child began to play with other children in the classroom. If peer buddies were not part of the play group, this indicated that the target child was able to engage in play with other children without support from a peer buddy.

Data collection. The duration of the target child's play, the number of children the target child was playing with, and whether or not the peer buddy was playing with the target child were coded via video. Duration for target child play began when the target child met the definition for play and ended when the target child no longer met the definition for play with any children in the classroom. A total play duration was calculated by summing the duration from each episode of play. During the duration of the target child meeting the definition for play, the number of children the target child was playing with and whether either peer buddy was present as part of the play group was recorded.

Target child initiations and responses. See Appendix K for detailed codes for target child initiations and responses, including examples, non-examples, and decision rules.

Response Definitions. To evaluate the effects of the intervention on the target children's talk, four behaviors were coded: (1) initiations to peer buddies, (2) responses to peer buddies, (3) initiations to other children in the classroom, and (4) responses to other children in the classroom.

Initiations to peer buddies. Initiations to peer buddies was defined as the target child initiating or attempting to initiate a verbal or nonverbal interaction directed toward either peer buddy. Initiations to peer buddies could include: (a) statements that were validating, such as praise or compliments; (b) statements intended to help or assist, (c) statements that were

comments or questions; and (d) nonverbal child-initiated interactions, including validating gestures or physical affection or other appropriate nonverbal initiations.

Responses to peer buddies. Responses to peer buddies was defined as the target child responding or attempting to respond to the peer buddies with a verbal or nonverbal interaction. Target child responses occurred following an interaction initiated by a peer buddy and could include statements directed to the peer buddy that were considered positive, such as praise, complimentary, or acknowledging in nature; statements intended to help, assist, or that were supportive in nature; or comments or questions. Target child responses could also be nonverbal gestures or appropriate demonstrations of affection.

Initiations to other children in the classroom. Initiations to other children in the classroom was defined in the same way as initiations to peer buddies, except the target child was directing the initiation toward another child in the classroom instead of a peer buddy. Initiations to other children in the classroom was defined as the target child initiating or attempting to initiate a verbal or nonverbal interaction directed to a child in the class who was not the peer buddy. Initiations to other children could include: (a) statements that were validating, such as praise or compliments; (b) statements intended to help or assist; (c) statements that were comments or questions; and (d) nonverbal child-initiated interactions, including validating gestures, physical affection, or other appropriate nonverbal initiations.

Responses to other children in the classroom. As with initiations, responses to other children in the classroom was defined in the same way as responses to peer buddies, except the target child was responding to other children in the classroom instead of a peer buddy. Target child responses occurred following an interaction initiated by a child in the classroom who was not the peer buddy and could include: (a) statements directed to another child in the class that

were considered positive such as praise, complimentary, or acknowledging in nature; (b) statements intended to help, assist, or that are supportive in nature; or (c) comments or questions. Target child responses could also be nonverbal gestures or appropriate demonstrations of affection.

Data Collection. Event recording was used to code target child initiations and responses. Specifically, observers recorded target child initiations and responses from video using MOOSES on a Dell Latitude ST touch screen slate (i.e., tablet).

Class-wide social engagement. A measure of class-wide social engagement was added after the study had begun. This measure was added because there was no method to measure the impact of the whole class trainings on the social engagement of children at a class-wide level. Class-wide observations began in classroom 1 during the maintenance condition and in classroom 2 during the intervention condition. Class-wide observations began in classrooms 3 and 4 during the baseline condition. Class-wide social engagement was measured in the activity buddy time typically occurred approximately every two weeks. During the intervention condition, the class-wide social engagement observation occurred before buddy time occurred. See Appendix L for detailed codes for class-wide social engagement, including examples, non-examples, and decisions rules, and the associated data collection form.

Response Definition. To evaluate the effects of the intervention on class-wide social engagement, children were defined as being socially engaged if they were proximal/oriented towards a peer or peers and engaged with the same or similar materials or using materials in the same way as the peer(s).

Data Collection. A 15 s interval-based recording system was used to code class-wide social engagement during a live, 15-min observation. Each interval consisted of 10 s of

observation and 5 s to record. At the start of the observation, the data collector recorded how many adults and children were present in the classroom. During the observation, the observer scanned the classroom for 10 s and counted how many children did not meet the definition for being socially engaged. At the end of the observation interval, the observer recorded the number of children who were not socially engaged, as well as the number of children who were socially engaged on the data collection form for that interval during a 5 s recording interval. The observer also recorded notes (e.g., a child left the room for the bathroom, a child was called to work one-on-one with an adult, etc.) during the recording interval. The 15-min observation included 60 10 s observation intervals for a total observation time of 10-min. At the end of the observation, the data collector again recorded the number of children present in the classroom. The average percentage of children socially engaged across intervals was then calculated.

Sociometric Rating Activity

Prior to baseline data collection and during maintenance, each child in the class participated in a sociometric rating activity to assess the target child and peer buddies' sociometric status in the class. By assessing the participants' sociometric status before the study began and after completion of the study, the effects of the intervention on the sociometric status of the peer buddies and target children could be examined. The researcher conducted the sociometric rating activity with children prior to baseline data collection, and a graduate research assistant conducted the sociometric rating activity at the completion of the study to avoid expectancy effects (Ledford & Gast, 2018)

The procedures were based on those described by Asher, Singleton, Tinsley, and Hymel (1979). Asher and colleagues (1979) described having children assign pictures of classmates to one of three faces according to how much they like to play with that person.

Asher and colleagues (1979) used a happy face, neutral face, and sad face. For this study, children were asked to sort classmates using a very happy face, a happy face, and a neutral face instead (see Appendix M). This change was made to avoid potential negative effects of asking children to sort classmates into a 'sad face' category. In addition, children practiced using the scale first with food items, which was not included in Asher and colleagues' (1979) procedure.

Each consented child in the class, including the peer buddies and target child, participated in the sociometric rating activity by sorting the children in the class into one of three categories, which were then converted to a 3-point Likert scale. In a separate room, each child was first asked to demonstrate an understanding of the rating system. Children were asked to sort food into three boxes: box one with a very happy face on it that meant the child ate the food all the time, box two with a happy face that meant the child ate the food sometimes, and box three with a neutral face that meant the child didn't eat the food very much. Once the child demonstrated an understanding of the boxes by placing pictures of typically less preferred foods (e.g., broccoli, Brussel sprouts, etc.) in the box with the neutral face and pictures of typically preferred foods (e.g., ice cream, cookies, etc.) in the box with the happy or very happy face, the child was asked to sort pictures of classmates into the boxes.

The child was asked to sort pictures of each classmate into the three boxes and was told the really happy face meant '*you play all the time with that friend'*, the happy face meant *'you play with that friend sometimes'*, and the neutral face meant '*you don't play with that friend very much.'* Each picture had the child's ID number on the back. This ID was recorded on the sociometric activity form once the child was finished sorting (see Appendix M). All children received a score of 1, 2, or 3 from each of their classmates. The scores given by each child in the class were added and the total number was divided by the number of children who

completed the rating activity, providing an average sociometric rating for each child. The average rating for each child in the class was then added and the total was divided by the number of children who completed the rating, providing an overall class average and range across all children who participated in the sociometric rating activity. Asher et al. (1979) reported high test-retest correlations for the rating scale social validity measure. The test-retest correlation for the rating scale measure was also reported as being significantly higher than nomination measures where the child was asked to nominate a classmate that was his/her best friend (Asher et al., 1979).

Social validity

After completion of the study, two social validity measures were completed (see Appendix N). Both social validity questionnaires were used in the previous study (Milam et al., 2018).

Social validity questionnaire for teachers. The teachers of each target child completed a social validity questionnaire to rate: (a) the effectiveness of the intervention in increasing the target child's interactions with the peer buddies and other children in the class; (b) whether the teacher noticed the peer buddy using the SPT strategies with the target child or other children in the class during other times of the day; and (c) the acceptability of the intervention. The questionnaire consisted of seven questions rated on a 5-point Likert scale from *strongly disagree* to *strongly agree* (see Appendix N).

Social validity questionnaire for pre-service teachers. Twelve early childhood pre-service teachers rated the target children's social engagement with peers to determine if the SPT intervention produced socially significant changes. Four 2-min video clips for each target child were presented in a random order. Two video clips were randomly chosen from the baseline

condition, and two video clips were randomly chosen from the intervention condition; the pre-service teachers were naïve to these conditions. Following each video clip, the pre-service teachers were asked to rate the target child's social engagement with peers on a 5-point Likert scale from *poor* to *excellent* (see Appendix N).

Experimental Design

A multiple probe design across peer buddy-target child groups was used to evaluate the effects of the SPT intervention on peer buddies' use of SPT strategies with target children as well as the effects of the SPT intervention on target children's behaviors (Gast, Lloyd, & Ledford, 2018). In multiple probe designs, experimental control is demonstrated through the staggered introduction of the independent variable, with immediate changes in behavior occurring only after the independent variable is introduced (Gast et al., 2018). Independence across target child-peer buddy groups (i.e., tiers) could be ensured by including only one peer buddy-target child group per classroom in the study. This design was preferable to a multiple baseline design because data could be collected less frequently during baseline. A multiple probe design was also necessary, instead of a withdrawal design, because the goal was that the peer buddies and target children would learn new skills and continue to use the skills once intervention ended.

By staggering the introduction of the intervention across tiers, multiple probe designs control for various threats to internal validity including history, maturation and testing (Gast et al., 2018). Single-subject research methodology requires one demonstration and two replications of an effect to demonstrate a functional relation. The decision to include four peer buddy-target child groups instead of three was made to control for attrition and ensure an opportunity to demonstrate a functional relation even if a triad dropped out of the study. Because the primary

research question was whether the peer buddies could implement the SPT strategies with fidelity, decisions about changing conditions were made based on peer buddy strategy use.

Procedures

Pre-baseline measures. Teachers completed a demographic questionnaire that included the following information: (a) gender, (b) age, (c) race/ethnicity, (d) years of experience working with young children, (e) current position, (f) amount of time in current position, and (g) teaching certification (see Appendix O).The Teaching Pyramid Observation Tool for Preschool Classrooms (TPOT; Hemmeter, Fox, & Snyder, 2014) was also conducted with each teacher to provide descriptive information on teachers' use of *Pyramid Model* practices to promote social-emotional competence and prevent challenging behavior in their classrooms (Hemmeter, Snyder, Fox, and Algina, 2016). TPOT scores were not used for inclusion or exclusion purposes. The TPOT is administered by conducting an approximately 2-hr observation and 15-20 min interview with the teacher (Hemmeter et al., 2014). The TPOT has 112 indicators organized under 14 key *Pyramid Model* practice items, 17 red flags, and one item with 3 essential strategies related to the teacher's responses to challenging behavior (Hemmeter et. al., 2014). See Table 1 for demographics and TPOT scores.

Five types of information on the peer buddies and target children were also collected. First, teachers were asked to complete a questionnaire on child demographics (see Appendix O) including: (a) the child's birthdate, (b) gender, (c) race/ethnicity, (d) disability status, and (e) disability, if applicable. Second, teachers were asked to complete the SSIS (Gresham & Elliott, 2008) and the ASQ:SE-2 (Squires, et al., 2015) to collect information on the peer buddies' and target children's social skills and problem behavior. The SSIS provides standard scores and percentile ranks in the areas of social skills and problem behavior. The ASQ:SE-2 screens seven

key behavioral areas: self-regulation, compliance, communication, adaptive functioning, autonomy, affect, and interaction with people to determine if children need further assessment, should be monitored, or do not require monitoring compared to cutoff scores for each age group (Squires et al., 2015). Third, play behaviors of the peer buddies and target children were observed during three 10-min observations to report children's current level of play (see Appendix P). Finally, peer buddies and target children were assessed using the Mullen (Mullen, 1995). The Mullen provides percentile ranks and age equivalents for four cognitive scales: visual receptive, fine motor, receptive language, and expressive language. It also provides an Early Learning Composite score. The Mullen was used to report children's developmental levels. See Table 2 for peer buddy and target child demographics and Table 3 for assessments scores.

Baseline. During the baseline condition, the researcher asked each of the four teachers to continue all typical classroom activities and interact with children in the class as they typically would. Using the multiple probe design, baseline probes were collected on peer buddies' implementation of SPT strategies concurrently across all four peer buddy-target child groups. Initial baseline probes occurred daily, followed by probes occurring an average of every three days. For baseline probes, the researcher video recorded the four target children for 10-min and videos were coded for peer buddy SPT strategy use with the target child, as well as target child behavior (i.e., engagement in play, initiations and responses). All baseline session videos were viewed by a research assistant to confirm the researcher and teachers did not interfere or implement study procedures during baseline probes.

Training sessions. Training sessions were implemented with three of the four peer buddy-target child groups and their classmates. Over the course of baseline probes, Caleb, the target child in classroom 4, began engaging in play with his peers at high levels and no longer

met inclusion criteria for participation. The researcher taught the SPT strategies during three whole class training sessions and three triad (i.e., two peer buddies and one target child) training sessions over three consecutive days for each triad. The average duration of whole class training sessions across the three classrooms was 19-min, 3 s, and the average duration of triad training sessions across the three triads was 10-min, 25 s. See Table 4 for the duration of each training session, as well as averages across trainings, classrooms, and triads.

Whole class training sessions. During the whole class training sessions, all children in the class, including the buddies and target children, participated. This was different than in the previous study when only the peer buddies participated in training sessions (Milam et al., 2018). Including all children in whole class training sessions was added as a strategy to promote generalization and maintenance. The first whole class training session introduced staying with friends, the second session reviewed staying with friends and introduced playing with friends, and the third session reviewed staying and playing with friends and introduced talking to friends. Whole class training sessions occurred in the classroom in the area in which large group activities typically occurred. All whole class training sessions were video recorded.

Although the researcher led all training sessions, the teacher was involved in each whole class training session. Including the teacher in whole class training sessions was added as a strategy to promote generalization and maintenance. Before whole class training sessions began in each class, the researcher met briefly with the teacher to determine the best time of day for the whole class training sessions to occur and to generally describe the training protocols. The researcher also described what the teacher was supposed to do during the whole class training sessions. Ms. Elaine, Eli, Jakobe, and Hunter's teacher, asked to view a video of a training conducted with a previous class as a way to feel more comfortable with the researcher's

expectations for her during the whole class trainings. After obtaining permission from Ms. Sarah, Ms. Elaine watched a video from one of Ms. Sarah's training sessions. The teachers participated in role play activities with the researcher, assisted children during practice with each other, and assisted with children's behavior as needed.

Each whole class training session was videotaped and included the following activities: (a) the scripted story was read and the importance of being a buddy was discussed; (b) if applicable, previously taught strategies were reviewed; (c) the new strategy was introduced using the visual; (d) children were asked to demonstrate understanding of the meaning of the visual by repeating the strategy aloud; (e) what it meant to perform the strategy was described in child-friendly language; (f) examples of how to perform the strategy were discussed; (g) the strategy was modeled by the researcher with the teacher acting as the target child; (h) children practiced the strategy with each other, and (i) the skills were reviewed by the researcher and children were reminded they should be buddies all of the time. During practice activities, children were divided into small groups. The researcher and teacher each led a group in practicing the strategy with peers. The teacher led the group with the peer buddies and target child. Each training session concluded with a review of the strategy and a reminder to use the strategy with friends during buddy time and across the day with friends. See Appendix E for detailed protocols for each whole class training session.

Triad training sessions. Three triad training sessions with the peer buddies and target child occurred following each of the three whole class training sessions. The purpose of the triad training session was to provide the peer buddies with opportunities to practice each SPT strategy with the target child. The triad training sessions were video recorded and occurred in the classroom when the other students in the class were not present. All triad training sessions

occurred on the same day as the whole class training sessions. The teacher was not involved in the triad training sessions. The triad training sessions followed the same general procedures as the whole class trainings. The scripted story was read to the triad including the target child. During the reading of the scripted story, the researcher referred to the target child as a friend who might be too shy to play with other children in the classroom. The researcher then asked the target child if s/he agreed and if s/he would like the peers to be a buddy during buddy time. All three target children agreed. The peer buddies also agreed to participate as a buddy with the target child during buddy time. The strategy was then briefly reviewed, and individualized examples for how to implement the SPT strategy were provided. The specific centers the target child typically played in and the materials the target child typically played with were used in examples when discussing the SPT strategy. The peer buddies then took turns implementing the SPT strategy with the target child and received prompts and feedback from the researcher. Although the prompts and feedback were directed to the peer buddy to use the SPT strategies, the researcher encouraged the target children to respond to peer buddies' play initiations and questions asked by the peer buddies if the target child was not responding. See Appendix F for detailed protocols for the triad training sessions.

Booster training sessions. Booster training sessions occurred for two of the three classrooms. Due to scheduled breaks and participant absences, long breaks (i.e., breaks lasting longer than 6 school days) occurred. Taisha, Kayla, and Lila and their classmates participated in a whole class booster training session due to a long break. Robert, Leilani, and Anna and their classmates participated in a whole class booster session, and the triad participated in an additional triad booster session due to long breaks. The average duration of whole class booster

training sessions across the two classrooms was 6-min, 41 s. The duration of the triad booster training session for Robert, Leilani, and Anna was 14-min, 4 s (see Table 4).

During the whole class booster training sessions, the researcher, with assistance from the teacher: (a) reminded children of the importance of buddy time, (b) reviewed the definition of each SPT strategy and the associated visual, (c) modeled the SPT strategies with the teacher acting as the target child, (d) reviewed all three SPT strategies while referring to the visuals, and (e) reminded children they should be buddies all the time. The triad booster session followed similar procedures, except, instead of the researcher modeling the SPT strategies, the peer buddies were provided an opportunity to practice the SPT strategies with the target child. See Appendix G for detailed protocols for the booster training sessions.

Buddy time. Buddy time refers to the activities in which the peer buddies were observed to determine if they were using the SPT strategies they were taught during the whole class and triad training sessions. These observations occurred daily during free play time and the first 10-min were video recorded.

Although two peer buddies were identified for each target child, the peer buddies took turns implementing the SPT strategies with the target child on a rotating schedule. For example, on Monday, Taisha participated in buddy time with Lila, and on Tuesday, Kayla participated in buddy time with Lila. The peer buddy who was not assigned to buddy time for the day was not discouraged from implementing the strategies with the target child, but the researcher only provided prompting and feedback to the peer buddy assigned to participate in buddy time that day. If a peer buddy was absent or expressed that s/he did not wish to participate in buddy time that day, the other peer buddy was asked to participate instead. A peer buddy was not asked to participate in buddy time more than two days in a row to avoid fatigue.

Once both types of training sessions occurred, the SPT visuals were posted in the classroom and remained posted for the duration of the study. Upon entering the classroom, the researcher checked with the teacher to make sure it was an appropriate time to conduct buddy time. Once the camcorder and all needed materials (i.e., SPT checklist, visual timer, small SPT visuals) were available, the researcher began recording and then prompted the teacher to make a general announcement to the class. The general announcement was: "It is buddy time. Remember, you should stay, play, and talk to your friends!" During the buddy time announcement to the class, the teacher held each visual up so the class could see them as she said the strategy. Following the teacher's general announcement, the researcher talked to the peer buddy individually to remind the peer buddy of the strategies and explain the expectations during buddy time using the SPT checklist and visual timer. The researcher explained to the peer buddy that s/he was expected to stay, play, and talk to the target child, and that, when the visual timer beeps, the SPT checklist would be reviewed to determine if the peer buddy had used each of the SPT strategies with the target child and had earned a prize. The researcher then set the visual timer for 10-min.

During buddy time, a system-of-least prompts (SLP) procedure was implemented with the peer buddy. See Appendix Q for a detailed description of the SLP procedure. If the peer buddy had not moved toward the target child and begun playing within 12-20 s, the researcher implemented the first prompt in the SLP hierarchy. Waiting at least 12 s but not more than 20 s allowed time for the peer buddy to begin implementing the strategies independently, but did not allow too much time to pass without the peer buddy implementing the SPT strategies. The researcher implemented the following SLP procedure: wait 12-20, if the peer buddy did not use a strategy, the researcher provided a visual/gestural prompt by gaining the peer buddy's attention

and pointing to the small visual of the strategy, wait 5 s, provided a verbal prompt while pointing to the small visual of the strategy (e.g., "Make sure you are staying close to _____."), wait 5 s, and provided the controlling prompt. Although controlling prompts were never needed, the planned controlling prompt for the 'stay' and 'play' strategies was a physical prompt and the planned controlling prompt for the strategy 'talk' was a verbal model.

At the conclusion of buddy time (i.e., when the visual timer signaled the end of the 10-min session), the researcher reviewed the SPT checklist with the peer buddy outside of the classroom so the peer buddy could focus while feedback was provided. If the peer buddy demonstrated a strategy, a checkmark was placed below the picture of the strategy. The peer buddy chose a prize from the prize box if s/he received a checkmark for using all three strategies. If the peer buddy had not earned a checkmark, the researcher provided a brief explanation of why the checkmark was not earned and described how the peer buddy could implement the strategy correctly during the next buddy time.

Fading of buddy time procedures. Once a peer buddy's SPT strategy use was stable at significantly higher levels than baseline, the researcher began systematically fading buddy time procedures. The first step in fading was the researcher removing the SLP procedure during buddy time. The teacher made a general announcement about buddy time (i.e., "It is buddy time. Remember, you should stay, play, and talk to your friends!"). Before buddy time, the researcher reminded the peer buddy of the SPT strategies using the SPT checklist. Following buddy time, the researcher reviewed the SPT checklist with the peer buddy and awarded a prize if earned. No additional prompts were provided by the teacher or researcher during buddy time. The second step in fading was the researcher removing the SPT visual checklist at the beginning of buddy time. The teacher made a general announcement about buddy time (i.e., "It is buddy time.

Remember, you should stay, play, and talk to your friends!"). Before buddy time, the researcher verbally reminded the peer buddy of the SPT strategies. Following buddy time, the researcher reviewed the SPT checklist with the peer buddy and awarded a prize if earned. Again, no additional prompts were provided by the teacher or researcher during buddy time.

Maintenance. As a way to program for maintenance, the teacher was involved with all training sessions and provided a general announcement before buddy time in all intervention and generalization sessions.

Maintenance sessions began after the intervention had been faded as described above. The researcher recorded maintenance sessions once a week during the same time of day in which buddy time occurred. Three maintenance sessions occurred for two of the peer buddy-target child groups (Taisha, Kayla, and Lila and Eli, Jakobe, and Hunter). Because Anna withdrew from the center, only one maintenance session occurred for her peer buddy-target child group (Robert, Leilani, and Anna). Maintenance session videos were coded for peer buddy SPT strategy use with the target child, target child play duration, and target child initiations and responses. During maintenance sessions, the teacher made a general announcement about buddy time (i.e., "It is buddy time. Remember, you should stay, play, and talk to your friends!"). Following a drop in SPT strategy use during the first maintenance probe with the first peer buddies, Taisha and Kayla, the researcher added a reminder to the peer buddies individually. The researcher reminded the peer buddies that they should play with the target child if they noticed s/he was playing alone. This reminder was added to ensure that the peer buddies understood that they still needed to implement the SPT strategies if needed with the target children; however, they did not need to interrupt the target child's play with other children in the classroom.

Generalization. Generalization of peer buddies' use of SPT strategies, as well as target child behaviors, was measured during another free play time once a week. For classroom 1 and classroom 2, generalization sessions occurred outside because no other free play time occurred inside. For Eli, Jakobe, and Hunter in classroom 3, generalization sessions occurred during the afternoon free play time in the classroom following afternoon snack.

Before the generalization sessions began, the teacher provided the general announcement about buddy time to the class (i.e., "It is buddy time. Remember, you should stay, play, and talk to your friends!"). No other prompts or reminders were provided. The researcher video recorded for 10-min and the videos were again coded for peer buddy SPT strategy use with the target child, target child play duration, and target child initiations and responses. Generalization was measured during baseline, intervention, and maintenance conditions. During generalization sessions, in the intervention and maintenance conditions, the SPT visuals were displayed in the classroom. Table 5 provides a description of the specific procedures that were designed to program for generalization across peers and settings for peer buddies and target.

Procedural Fidelity

Fidelity data were collected throughout the study to ensure adult (i.e., researcher and teacher) adherence to procedures (Barton, Meadan-Kaplansky, & Ledford, 2018; see Appendix R).

All training sessions were video recorded, and the fidelity of all training sessions (i.e., whole class training sessions, triad training sessions, whole class booster training sessions, and triad booster training sessions) was coded by a research assistant using the applicable SPT Training Procedural Fidelity Checklists (see Appendix R). The number of steps implemented

correctly was divided by the total number of planned training steps and multiplied by 100 to determine the training session procedural fidelity.

The average fidelity of whole class training sessions was 98.89% with a range of 90-100% (see Table 6). The average fidelity of triad training sessions was 96.14% with a range of 87.5-100%. The average fidelity of the whole class booster training sessions for Taisha, Kayla, and Lila and their classmates and Robert, Leilani, and Anna and their classmate was 91.67% with a range of 83.33-100%. The fidelity of the triad booster training session for Robert, Leilani, and Anna was 100%.

Procedural fidelity during baseline, buddy time, generalization, and maintenance sessions was also measured. In 59% of sessions distributed across participants and conditions, a research assistant coded the researcher and the teacher's fidelity via video recording using the procedural fidelity form (see Appendix R). Throughout all conditions, the teacher's adherence to procedures was measured. The teacher's behavior during baseline conditions was coded to ensure no announcement for buddy time was given. During buddy time, generalization, and maintenance sessions, the teacher's implementation of the general announcement to the class was measured. In addition, the researchers' adherence to procedures before buddy time, adherence to the system-of-least prompts procedures during buddy time, and adherence to procedures after buddy time were coded. Procedural fidelity was calculated by dividing the total number of steps/procedures implemented correctly by the total number of steps/procedures, and multiplying by 100. The researcher and teacher's average procedural fidelity across conditions was 99.13% with a range of 83.33-100% (see Table 7).

Observer Training and Inter-Observer Agreement

Coders for this study were three graduate students. Two research assistants were trained on each of the three measures coded via video. The researcher first provided a coding manual for the research assistants to review (see Appendices I, J, and K). The researcher then met with the research assistants to discuss the codes and answer any questions. During this meeting, video examples were viewed and discussed. Following this meeting, the research assistants were given 10-min videos to code. Research assistants coded three videos at 90% accuracy to be considered reliable on each measure. The third research assistant was trained to conduct the live, class-wide social engagement measure (see Appendix L). Similar training procedures were followed; however, live observations were conducted as a way for the research assistant to demonstrate 90% accuracy across three observations.

For peer buddy SPT strategy use with the target child and target child play duration, inter-observer agreement (IOA) was calculated using the point-by-point method by dividing the total number of agreements by the number of agreements plus disagreements, and multiplying by 100. For start and end times, agreement occurred if the start time and end time are within 5 s of the primary coder's start time and end time. For the target child initiations and responses, MOOSES was used to record event time sampling data. The data was compared using a 5 s window. An agreement was scored if a match was found between the two observers (within the 5 s window). The agreements and disagreements were used to calculate a percentage agreement score. The number of agreements was divided by the number of agreements plus disagreements and this number was then multiplied by 100 to obtain the agreement percentage.

IOA data on peer buddy SPT strategy use, target child play duration, and target child initiations and responses were collected for 40.17% of sessions distributed across all participants

and conditions. Average IOA was 94.63% (range = 68.75-100%) for peer buddy's strategy use (see Table 8), 94.73% (range = 68.75-100%) for target child play (see Table 9), and 90.44% (range = 66.67%-100%) for target child initiations and responses (see Table 10). IOA data on class-wide social engagement was collected for 45.45% of sessions distributed across classrooms. Average IOA was 86.67% (range = 81.67-91.67%) for class-wide social engagement.

CHAPTER III

RESULTS

Peer Buddy Implementation of the SPT Strategies

The primary research question addressed in this study was whether training and adult support were effective for teaching peer buddies to implement the SPT strategies with fidelity. The results are shown in Figure 1. Data are presented as the duration of complete, unprompted SPT episodes per 10-min buddy time. Prompted SPT strategy use is not included. All six peer buddies who participated in training showed immediate increases in SPT strategy use following training sessions and remained at levels significantly higher than baseline throughout the intervention condition.

Taisha and Kayla did not implement the SPT strategies at any point during buddy time sessions in baseline. During Taisha's first buddy time session following training, there was an immediate increase in level. During this first buddy time session in intervention, she implemented the SPT strategies with Lila for the entire 10-min buddy time session. The level of Taisha's SPT strategy use remained high and stable, with Taisha implementing the SPT strategies for over 9-min for five of the six buddy time sessions in the intervention condition. The shortest duration of her SPT strategy use during intervention was 8.5-min. During Kayla's first buddy time session in intervention, there was also an immediate increase in level; she implemented the SPT strategies with Lila for 6-min. During her second buddy time session in intervention following a break and whole class booster training session, the duration of Kayla's implementation of the SPT strategies increased to 10-min and remained high and stable.

The level of SPT implementation was also zero during all baseline probes for Anna's peer buddies, Robert and Leilani. Robert's implementation of the SPT strategies immediately increased in level during his first buddy time session in intervention. During his first two buddy time sessions in intervention, he implemented the SPT strategies with Anna for about 6-min. During his third buddy time session in intervention, which followed a break and a whole group booster training session, the duration of Robert's implementation of the SPT strategies increased to 7.5-min and remained high and stable for the remainder of the intervention condition. Leilani implemented the SPT strategies with Anna for 7-min during her first buddy time session in intervention, demonstrating an immediate increase in level. The duration of Leilani's SPT strategy use with Anna was above 9-min for the remainder of the intervention condition.

Eli and Jakobe's SPT strategy use with Hunter was at near zero levels during baseline probes. During one baseline probe, Eli implemented the SPT strategies with Hunter for 1.5 min. Eli and Jakobe did not implement the SPT strategies with Hunter during any other baseline probe. During Eli's first buddy time session in intervention with Hunter, there was an immediate increase in level to 9.5-min. The duration of Eli's SPT strategy use was high and stable for the rest of the intervention condition remaining above 8.5-min. The duration of Jakobe's SPT strategy use also demonstrated an immediate increase in level during his first buddy time session in intervention. Jakobe implemented the SPT strategies for 9-min during his first buddy time session in intervention, and his implementation of SPT strategies remained high and stable.

While buddy time was designed to include the use of SLP by the investigator, the number of prompts peer buddies needed to implement the SPT strategies was minimal (see Table 11). Taisha did not require any prompts, while Kayla required one gestural prompt during her first buddy time session in intervention to stay with Lila. Anna's peer buddy, Robert, required the

most prompts. Robert required one gestural prompt to stay, one verbal prompt to play, and two verbal prompts to talk over the course of his first three buddy time sessions in intervention. He required no further prompting after the third session. Leilani, Anna's other peer buddy, required one verbal prompt to stay during her second buddy time session in intervention. Eli, Hunter's peer buddy, required one verbal prompt to play during his first buddy time session in intervention. Jakobe did not require any prompting to implement the SPT strategies with Hunter.

The researcher began fading buddy time procedures with Lila's peer buddies after Taisha had implemented SPT strategies with high fidelity during three consecutive buddy time sessions in intervention and after Kayla had implemented SPT strategies with high fidelity during four consecutive buddy time sessions in intervention. Due to two extended breaks, fading occurred with Anna's peer buddies, Robert and Leilani, after nine buddy time session in intervention each. When fading occurred, Robert had implemented the SPT strategies with high fidelity during three consecutive buddy time sessions in intervention and Leilani had implemented the SPT strategies with high fidelity during four consecutive buddy time sessions in intervention. Fading began for Eli and Jakobe, Hunter's peer buddies, after each had implemented SPT strategies with fidelity for three consecutive buddy time sessions in intervention. All but one of the peer buddies continued to implement the SPT strategies with high fidelity after the SLP was faded. Taisha's (Lila's peer buddy) implementation of SPT strategies decreased slightly following the removal of the SLP prompts, so a second buddy time session in intervention occurred for Taisha before the intervention procedures were faded further.

After one buddy time session in intervention for five of the peer buddies and two buddy time sessions in intervention with one of the peer buddies (Taisha) with the SLP faded, the researcher further faded the intervention procedures by fading the use of visuals at the beginning

of buddy time. The teacher made the general announcement about buddy time (i.e., "It is buddy time. Remember, you should stay, play, and talk to your friends!"). Before buddy time, the researcher provided a verbal cue to the peer buddy (without using visuals). Following buddy time, the researcher reviewed the SPT checklist with the peer buddy and awarded a prize if earned. No additional prompts were provided by the teacher or researcher during buddy time.

All six peer buddies across the three classrooms implemented the SPT strategies with the target children at high and stable levels, demonstrating a functional relation between peer buddies receiving training and SLP and their ability to implement the SPT strategies with fidelity.

Target Child Engagement in Play

Two measures of target children's play were included. First, the duration with which target children played with other children during buddy time was measured. The number of different children the target children played with during buddy time was also measured. All three target children's duration of engagement in play immediately increased when buddy time sessions in intervention began (see Figure 2), as did the number of different children they played with (see Table 12).

During baseline probes, Lila's duration of play engagement was below 1-min. During the first buddy time session in intervention, her duration immediately increased to 10-min and remained above 8.5-min for the remainder of the intervention condition. In addition, the number of different children Lila played with during the intervention condition increased from a mean of .60 in baseline probes to 3.30 in buddy time sessions in intervention.

The duration of Anna's engagement in play was variable but remained below 4.5-min during baseline probes. During her first buddy time sessions in intervention, her engagement in

play immediately increased to almost 8-min. Her play duration remained high and stable and followed a slight increasing trend for the remainder of the intervention condition. In addition, the number of different children Anna played with increased from a mean of 1.42 in baseline probes to 2.79 in the intervention condition.

During baseline probes, the duration of Hunter's engagement in play was below 2.5-min, with the exception of one probe when his play engagement was 7.5-min. During his first buddy time session in intervention, Hunter's play engagement immediately increased to 9.5-min and remained high and stable for the remainder of buddy time sessions in the intervention condition, never overlapping with baseline probes. In addition, the number of different children Hunter played with increased from a mean of .57 in baseline probes to 2.17 in the intervention condition.

The duration of all three target children's engagement in play during buddy time sessions in the intervention condition immediately increased in level and remained high and stable as compared to baseline probes, demonstrating a functional relation between peer buddies' implementation of the SPT strategies and the play engagement of target children.

Target Child Initiations and Responses

Results for target children's initiations and responses were mixed (see Figure 3). During baseline probes, the frequency of Lila's initiations was variable. The average frequency of her initiations and responses was 3.2, with a range of 0 to 9 across her five baseline probes. During Lila's first buddy time session in intervention, there was an immediate increase in the frequency of her initiations and responses. However, throughout the intervention condition, the frequency of Lila's initiations and responses was highly variable, with an average of 12.08 (0-31) initiations and responses. The frequency of Lila's initiations and responses overlapped with baseline probes during five of the 12 buddy time sessions in the intervention condition.

During Anna's baseline probes, the frequency of her initiations and responses was also variable, with an average frequency of 5.73 (0-15). During Anna's first buddy time session in intervention, there was an immediate increase in the frequency of her initiations and responses. As with Lila, the frequency of Anna's initiations and responses was highly variable, with an average of 12.5 (2-25) initiations and responses across the 20 buddy time sessions in the intervention condition. Anna's frequency of initiations and responses overlapped with baseline probes in 11 of her 20 buddy time sessions in the intervention condition.

Similar to Lila and Anna, the frequency of Hunter's initiations and responses was highly variable during baseline probes. The average frequency of his initiations and responses during baseline probes was 12, with a range of 0-41. During Hunter's first buddy time session in intervention, there was an immediate increase in level from his final baseline probe; however, the frequency of his initiations and responses overlapped with baseline probes in 100% of buddy time sessions in the intervention condition. The frequency of Hunter's initiations and responses stabilized during the intervention condition and showed an increasing trend. The average frequency of Hunter's initiations and responses across his 10 buddy time sessions in the intervention condition was 20.9, with a range of 13 to 29.

Due to the high variability in the frequency of initiations and responses across the three target children during baseline and intervention, a functional relationship between peer buddies' implementation of SPT strategies and the frequency of target child initiations and responses was not found.

Class-Wide Social Engagement

The decision to add the class-wide social engagement measure was not made until after the study began. Therefore, complete data are only available for Hunter's classroom. See Table

13 for class-wide engagement results for each classroom across conditions. The percentage of children socially engaged in Ms. Sarah's class was 54.98% and 66.30% for the two observations that occurred during maintenance. The percent of children socially engaged in Ms. Tasha's class was 75% and 78.42% for the two observations that occurred during intervention and 77.41% during the observation that occurred during maintenance. For Ms. Elaine's class during baseline, the percent of children socially engaged was 48.12% and 52.80%. During intervention, the percent of children socially engaged increased to 81.60%. The percent of children socially engaged in Ms. Elaine's class during maintenance was 74.07%, slightly decreasing from intervention but remaining higher than baseline.

Maintenance

Peer buddy maintenance of SPT strategy use. Maintenance data were collected following the intervention condition to determine if peer buddies continued to use the SPT strategies without adult support (see Figure 1). During buddy time sessions in maintenance, both peer buddies' implementation of SPT strategies with target children was examined. Taisha did not implement the SPT strategies with Lila during any buddy time session in maintenance. Kayla did not use the SPT strategies with Lila during the first buddy time session in maintenance. However, once a reminder was provided by the researcher (i.e., the researcher reminded the peer buddies that they should play with the target child if they noticed s/he was playing alone), Kayla implemented the SPT strategies with Lila at levels similar to those observed during intervention for the remainder of buddy time sessions in maintenance. Robert did not implement the SPT strategies with Anna during the one buddy time session that occurred in maintenance. However, Leilani implemented the SPT strategies at a similar level to intervention during the one buddy time session in maintenance that was collected for Anna. Both Eli and Jakobe implemented the

SPT strategies with Hunter at levels similar to those observed during intervention for all three buddy time sessions in maintenance.

Four of the six peer buddies across the three classrooms implemented the SPT strategies with the target children during buddy time sessions in maintenance at levels higher than baseline. A functional relation was demonstrated between peer buddies receiving training and the SLP and their implementation of the SPT strategies with target children, although this demonstration was weak.

Target child maintenance. To examine the extent of target child maintenance of skills, three types of data were examined. First, the target children's duration of engagement in play was examined (see Figure 2). Second, the average number of children the target children played with during buddy time sessions in maintenance was examined to determine if the average number of children played with remained at intervention levels (see Table 12). Finally, the target children's frequency of initiations and responses during buddy time session in maintenance was examined (see Figure 3).

Lila's duration of engagement remained at intervention levels during buddy time sessions in maintenance. The average number of children Lila played with during buddy time sessions in maintenance was two (range of 1-3). Although this is a slight decrease from the average number during intervention sessions, it remained higher than the average number of children found during baseline. The frequency of Lila's initiations and responses during maintenance probe sessions remained at intervention levels and stabilized.

Anna's duration of engagement remained at intervention levels during the one buddy time session that occurred in maintenance. The number of children Anna played with during the buddy time session in maintenance was two. Similar to Lila, this average is a slight decrease

from the average number during intervention but remained higher than the average found during baseline. The frequency of Anna's initiations and responses during the buddy time session in maintenance was lower in level than intervention and overlapped with baseline.

Hunter's duration of engagement remained at intervention levels during buddy time sessions in maintenance. The average number of children Hunter played with during buddy time sessions in maintenance was three (range of 2-5). The frequency of Hunter's initiations and responses during buddy time sessions in maintenance remained at intervention levels for the first two buddy time sessions in maintenance. However, during the third buddy time session in maintenance, the frequency of Hunter's initiations decreased in level.

Generalization

Peer buddy generalization of SPT strategy use. The peer buddies' implementation of the SPT strategies during other activities was variable (see Figure 1).

Taisha and Kayla were expected to implement the SPT strategies with Lila during an outside free play activity. Taisha and Kayla did not implement SPT strategies with Lila during generalization probes in baseline. Taisha did not implement SPT strategies during generalization probes in intervention. However, she did implement the SPT strategies in one of the two generalization probes that occurred during maintenance. Kayla's implementation of SPT strategies with Lila immediately increased in level during generalization probes following training. Her SPT strategy use with Lila during generalization probes in intervention was variable, however.

During baseline generalization probes, neither of Anna's peer buddies implemented the SPT strategies. The level of Robert's SPT strategy use remained at zero during all generalization probes in both intervention and maintenance. Leilani's implementation of the SPT strategies with

Anna remained at zero for the majority of generalization probes in intervention and maintenance. She implemented the SPT strategies for just under 3-min during one generalization probe in intervention.

During baseline generalization probes, neither peer buddy implemented SPT strategies with Hunter. During the first generalization probe in intervention, there was immediate increase in level for both Eli and Jakobe's implementation of SPT strategies with Hunter. In addition, the level of SPT strategy use with Hunter remained high and stable for both peer buddies during the second generalization probe in intervention and during generalization probes in maintenance.

Target child generalization. To examine the extent of target child generalization of skills, four different types of data were examined. First, the target children's duration of engagement in play was examined (see Figure 2). Second, the average number of children the target children played with during generalization probes before training was compared to the average number of children the target children played with following training to determine if the average number of children played with increased following peer buddy implementation of SPT strategy use (see Table 12). Third, the percentage of generalization probes in which the peer buddies were present was examined to determine if the target children were primarily playing with the peer buddies or if the target children had begun to play with other children in the class (see Table 12). Finally, the target children's frequency of initiations and responses during generalization probes was examined (see Figure 3).

During the baseline generalization probe, the duration of Lila's play engagement was just over 1-min. During the first generalization probe in intervention, Lila's play engagement increased in level to 9.5-min. Her play engagement duration remained high and stable during the other two generalization probes in intervention and during the two generalization probes in

maintenance. The average number of children Lila played with increased from 2.3 during generalization probes before training to 7.13 in generalization probes following training. For 25% of generalization probes in intervention, Lila interacted with other children in the class without either peer buddy present. The frequency of Lila's initiations and responses was zero during the baseline generalization probe. During the first generalization probe in intervention, the frequency of Lila's initiations and responses immediately increased. Although only a slight increase occurred, the frequency of Lila's initiations and responses during generalization probes in intervention and maintenance was higher than baseline levels and showed an increasing trend. Generalization was observed for Lila across all four measures.

The duration of Anna's engagement in play during baseline generalization probes was variable, ranging from .5-min to 4.5-min. During the first generalization probe in intervention, the duration of Anna's engagement in play immediately increased. The duration of her play engagement remained high and stable for all remaining generalization probes in intervention and maintenance. The average number of children Anna played with increased from 1.88 during baseline generalization probes before training to 3.61 in generalization probes following training. For the majority (62%) of generalization probes following training, Anna interacted with other children in the class without either peer buddy present. The frequency of Anna's initiations and responses during baseline generalization probes was variable. During the first generalization probe in intervention, the frequency of Anna's initiations and responses immediately increased. However, the frequency of Anna's initiations and responses during generalization probes was highly variable, with 100% of generalization probes in intervention overlapping with generalization probes in baseline. During the maintenance generalization probe, the frequency of Anna's initiations and responses was higher than both baseline and intervention. Although the

results of Anna's frequency of initiations and responses were weak, the other three types of data indicate that Anna generalized skills across children and activities.

The duration of Hunter's engagement in play during baseline generalization probes was slightly variable, ranging from 0-min to 3.5-mins across the four generalization probes. During the first generalization probe in intervention, Hunter's play engagement duration immediately increased to 9.5-min. The duration of his play engagement remained high and stable for all remaining generalization probes in intervention and maintenance. The average number of children Hunter played with increased from 1.06 during generalization probes before training to two in generalization probes following training. Unique to Hunter was that he did not play with other children during generalization probes following training; Hunter only played with peer buddies. The frequency of Hunter's initiations and responses during baseline generalization probes was low and stable. During the first generalization probe in intervention, the frequency of Hunter's initiations and responses immediately increased and showed an increasing trend. This increasing trend continued during the first two generalization probes in maintenance. However, the frequency of his initiations and responses decreased in level during the third maintenance probe. Although other children were not present during Hunter's play in generalization probes following training, the other three types of data indicate that Hunter generalized skills across activities.

Sociometric Rating Activity

The results for the target children's sociometric status from pre- to post- assessment were mixed (see Table 14). Lila and Anna's sociometric status decreased from pre- to post-assessment. However, Hunter's sociometric status improved from pre-assessment to post-assessment.

The average sociometric rating across each class was also examined to determine how the target children were rated in comparison to the class average. The average sociometric rating across children in Lila's class in pre-assessment was 2.49. The average rating across children decreased to 2.13 for post-assessment ratings. This indicates that, although Lila's rating decreased from pre- to post-assessment, her rating remained at similar levels when compared to the class average from pre- to post-assessment. The average rating across children in Anna's class also decreased from pre- to post- assessment, decreasing from 2.32 to 1.84, respectively. Even in comparison to the decrease in sociometric status across children in Anna's class, Anna's sociometric rating decreased more significantly. The average rating across children in Hunter's class remained relatively stable from pre- to post- assessment, with average class ratings of 1.95 and 2.01, respectively. This indicates that Hunter's increase in sociometric status from pre- to post-assessment was significant.

Social Validity

Social validity questionnaire for teachers. All three teachers who participated in the intervention strongly agreed that the SPT intervention was effective in increasing the target children's social interactions with the peer buddies as well as other children in the class (see Table 15). All three teachers also strongly agreed that they had noticed the peer buddies using the SPT strategies with the target children across the day. In addition, Ms. Sarah and Ms. Tasha strongly agreed and Ms. Elaine agreed that the peer buddies were using the SPT strategies with other children in the classroom. Finally, all three teachers strongly agreed that SPT is a feasible and appropriate intervention for increasing children's social interactions.

Social validity activity for pre-service teachers. Twelve pre-service teachers were asked to rate the target child's social engagement with peers on a 5-point Likert scale from *poor*

to *excellent.* Overall, naïve graduate students' ratings of the social engagement of target children increased with SPT intervention implementation (see Table 16). Before Taisha and Kayla were trained to implement SPT strategies with Lila, Lila's social engagement was rated as poor with an average score of 1. After Taisha and Kayla began implementing the SPT strategies with Lila, graduate students rated Lila's social engagement as average (2.83). Anna's social engagement also improved from poor (1.04) to average (3.08) following Robert and Leilani's implementation of the SPT strategies. Hunter's social engagement rating improved from poor (1.38) to above average (4.08) following Eli and Jakobe's implementation of the SPT strategies.

CHAPTER IV

DISCUSSION

This study's findings provide further evidence of the effectiveness of SPT. Two functional relations were demonstrated. First, a functional relation was demonstrated between adults' implementation of training and support and peer buddies implementation of the SPT strategies with target children (Strain & Fox, 1981; Strain & Kohler, 1998; Milam et al., 2018). Second, as with previous research, a functional relation was demonstrated between peer buddies' implementation of SPT and improvements in target children's social and communicative behaviors (English et al., 1997; Goldstein et al.,1997; Hughett et al., 2013; Kohler et al., 2007; Milam et al., 2018). Generally, peer buddies implemented the SPT strategies in generalization activities with the target children, producing positive outcomes in the target children's social engagement and initiations and responses in those activities. Furthermore, SPT was seen as socially valid by classroom teachers and produced socially significant changes in the target children's social engagement with peers.

Similar to previous findings, results maintained for the majority of peer buddies and for all target children (Milam et al., 2018). Three of the five previous SPT studies measured maintenance. Maintenance effects were strong in one study (Hughett et al., 2013) and mixed in the other two studies (Kohler et al., 2007; Milam et al., 2018). In the current study, four of the six peer buddies continued to implement the SPT strategies with fidelity during maintenance probe sessions. Although peer buddy SPT strategy use during maintenance was mixed, the play engagement for all target children remained at high levels throughout maintenance. Taisha, one

of Lila's peer buddies, and Robert, one of Anna's peer buddies, did not use the SPT strategies in the maintenance probes; however, Lila and Anna continued to engage in play at levels similar to the levels of play observed in intervention. Because the target children were engaged in play and because they had been told to notice if the target children were not engaging in play, the peer buddies likely did not see the need or have the opportunity to implement the SPT strategies. The majority of previous SPT studies did not examine peer buddies' implementation of SPT strategies, so this level of analysis was not available in previous studies.

This study also extends the SPT literature in multiple ways. First, similar to the study conducted by Milam et al. (2018), this study extended SPT to a new population of children. While most studies have examined the effects of SPT on children with disabilities, this study found that SPT to be an effective intervention for children who are socially isolated and are at-risk. The effects of social isolation on academics and behavior have been reported as a major concern in the field of early childhood education; however, limited research has focused on this population (Smith, Simon, & Bramlett., 2009). Children who are socially isolated may be overlooked in busy preschool classrooms and might not receive the support needed to engage in positive social interactions. In fact, in the current study, the target children were identified as socially isolated but were given minimal adult support to socially engage with peers. The baseline data on teacher prompting provide evidence of this limited support. Lila did not receive any prompts, Anna received an average of 1.18 prompts, and Hunter received an average of 1.21 prompts during baseline probes. At the end of the study, Lila, Anna, and Hunter's teachers reported that they did not know how to support these children and were thankful the researcher had implemented SPT in their classrooms. They also expressed a desire to keep the SPT visuals

and materials so that they would have an intervention to use with children they may have in the future who are socially isolated.

This study also extends the SPT literature by examining the fidelity with which the SPT procedures were implemented. The only previous SPT study that examined fidelity was conducted by Milam and colleagues (2018), which measured the fidelity of the researcher's adherence to training procedures, the researcher's adherence to buddy time procedures, and the peer buddies' implementation of the SPT strategies with the target children. In the current study, these same aspects of fidelity were measured. In addition, because the classroom teacher was involved in all whole class training sessions and buddy time sessions, it was also necessary to examine the teacher's adherence to the planned procedures. Both the researcher and classroom teacher were able to implement the SPT procedures with fidelity during both training sessions and buddy time sessions.

The final extension of the SPT literature relates to the addition of procedures to promote generalization of both peer buddy use of the SPT strategies and target children's engagement in play. Only two of the five previous studies examined generalization. Generalization across trained peer buddies was measured in Goldstein et al. (1997) but the effects were unclear due to the limited amount of data. Milam et al. (2018) found that peer buddies did not generalize the use of the SPT strategies to other activities, and generalization effects for target children were mixed. To program for generalization in the current study, the teacher assisted with all whole class training sessions, and the researcher and teacher incorporated examples in the training of how SPT strategies could be implemented during activities other than the planned buddy time. In addition, the peer buddies were encouraged to think about how they could implement the SPT strategies in other activities. The addition of these strategies was sufficient for promoting peer

buddy generalization of SPT strategy use in activities that were similar to the buddy time activity; however, the procedures were not effective in increasing peer buddy generalization to activities that were significantly different from the buddy time activity. Although peer buddies did not implement the SPT strategies in activities that were significantly different than buddy time, the play engagement of all three target children remained at high levels during these activities. Both of Hunter's peer buddies, Eli and Jakobe, implemented the SPT strategies in a similar indoor free play activity. Generalization effects were mixed for the other four peer buddies (Taisha, Kayla, Robert, and Leilani), who were expected to implement the SPT strategies in an activity that was significantly different than the buddy time activity. Kayla implemented the SPT strategies with Lila during an outside free play activity. However, while Taisha, Robert, and Leilani did not implement the SPT strategies outside, this may be because they did not have the opportunity. Following the teacher announcement about buddy time to the class, the children, including Lila and Anna, would often immediately pair with another classmate. Children would run to each other and say 'You're my buddy!' The pair would then run and play together, leaving little opportunity for the peer buddy to join in the play of the target child and classmate. This pairing that occurred during generalization sessions for Lila and Anna may explain why target child engagement in play remained at very high levels even though the peer buddies did not implement the SPT strategies with the target children. During the whole class training sessions, the researcher and teacher stressed to the children the importance of making sure everyone had a buddy to play with. The peer buddies might not have paired with the target child because another child in the class did.

Limitations

There are two primary limitations to this study. First, as discussed previously, limited data were available at the class-wide level because these data were not collected from the beginning of the study. The class-wide measure was added after the first triad was in intervention to aid in examining why Lila's engagement in play was remaining at high levels in generalization probes even though Taisha and Kayla were not implementing the SPT strategies with Lila. The data across conditions for Ms. Elaine's class shows that the intervention had an impact at a class-wide level; however, data for the other two classrooms was insufficient to determine effects. These data also helped explain why Lila and Anna's play engagement remained high even when their peer buddies (Taisha, Robert, and Leilani) were not implementing the SPT strategies. The class-wide social engagement data are limited, which should be addressed in future studies.

The second limitation is related to the sociometric rating measure. The changes in sociometric ratings for Lila and Anna from pre- to post- assessment do not reflect the changes that were observed in their engagement with other children in the classroom. During the post-assessment, peers, who had been observed playing with Lila and Anna, reported they did not play with those children. It is possible that the sociometric ratings reflect a different construct than what was actually observed in the classroom. That is, children's ratings of other children do not necessarily relate to how they actually interact with those children. Further, it is possible that Anna's challenging behavior could have impacted the how her peers rated her. Anna's play was rigid, and she was observed engaging in challenging behavior if other children in the class disrupted her play or played in a way that did not match hers. Research on sociometric status conducted with preschool children has explored the effects of a child's behavior as well as a

child's ability to regulate emotions (Denham, McKinley, Couchoud, & Holt, 1990; Eisenberg et al., 1993) on sociometric ratings. Finally, it is possible that the procedures used to conduct the sociometric ratings account for the findings. The researcher implemented the sociometric ratings during baseline while a master's level research assistant implemented the post-assessments. This was done to avoid expectancy effects (Ledford & Gast, 2018); the children might have answered in a way they thought the researcher would have expected since the researcher implemented the training sessions. While the research assistant was trained using procedures described above, no data were collected on the implementation of the sociometric ratings either prior to or following intervention. Although there is no reason to believe that the researcher and research assistants implemented the sociometric activity differently, this cannot be ruled out.

Implications for Research and Practice

This study has a number of implications for future research. First, future research could address the effects of SPT on communication skills. In the current study, initiations and responses were measured, but the effects were mixed. While the data show promise, it might be important to enhance the training for peer buddies to include more specific communication eliciting behaviors during the "talk" component of SPT. Future research also is needed to identify more effective procedures for supporting peer buddies to use SPT strategies across a variety of settings. The strategies implemented in this study were successful in supporting peer buddies' generalization of SPT strategies to activities that were similar to the primary activity in which buddy time occurred but did not effectively train peer buddies to use the SPT strategies in activities that differed from the intervention setting. Strategies that might be examined in future studies include providing practice opportunities in different kinds of settings and providing adult

prompts in across a variety of settings. In addition, future research should focus on the effects of whole class SPT trainings on children's social engagement at a class-wide level.

Finally, to address the research to practice gap, it will be important to examine strategies for supporting teachers to implement SPT with fidelity. Teachers in this study expressed an interest in implementing SPT with future students. In previous research on PM interventions, studies that involved the teacher or classroom staff in training and support found more limited outcomes (Milam & Hemmeter, 2017). While these studies did not measure fidelity, it is possible, given the nature of busy classrooms, that teachers did not implement the intervention with sufficient fidelity to promote stronger outcomes. To better understand this relationship, research is needed that addresses strategies for training and coaching teachers to implement SPT in the context of their ongoing classroom activities and routines.

Peer buddy implementation of the SPT strategies can produce socially significant increases in social engagement in target children and should be considered as an option for children who are socially isolated. In the current study, these outcomes were observed as a result of peer buddies receiving group training, small group training, prompting, feedback, and reinforcement. This has implications for how teachers plan, organize, and implement their daily schedules to provide this level of support to peers.

Conclusion

The current study extends previous research by providing additional evidence of the effectiveness of SPT (English et al., 1997; Goldstein et al.,1997; Hughett et al., 2013; Kohler et al., 2007, Milam et al., 2018). With training and adult support in the form of a SLP procedure, peer buddies were able to implement SPT strategies with fidelity with target children during free play. Additionally, when peer buddies implemented SPT strategies with fidelity, socially

significant changes in the target children's play engagement were observed. The effectiveness of SPT in increasing target children's social engagement in a generalization activity was demonstrated even though the peer buddies' implementation of the SPT strategies in the generalization activities was variable. In addition, peer buddies maintained SPT strategy use with the target children, and target children's social engagement maintained. Further research is needed to increase peer buddies' generalization of the SPT strategies. Future research is also needed to develop class-wide data collection procedures as well as effective strategies to support teacher implementation of SPT.

Table 1

Teacher Demographics and Teaching Pyramid Observation Tool (TPOT) Scores

Participant	Child participants	Age	Race	Years of experience	Years in current position	TPOT scores		
						Key practice item score	Number of red flags observed	Challenging behavior score
Ms. Sarah	Taisha, Kayla, & Lila	41	African-American	17 yrs.	1 yr.	61/112 (54%)	2	None observed
Ms. Tasha	Robert, Leilani, & Anna	31	African-American	7 yrs.	1 mos.	72/112 (64%)	2	None observed
Ms. Elaine	Eli, Jakobe, & Hunter	63	African-America	30 yrs.	17 yrs.	41/112 (37%)	6	None observed
Ms. Becky	Alyssa, Pierce, & Caleb	60	African-American	38 yrs.	33 yrs.	43/112 (38%)	2	None observed

Note. Age is in years, years of experience refers to experience with young children, key practice items refers to the 112 indicators organized under the 14 key *Pyramid Model* practice items (Hemmeter et. al., 2014).

Table 2

Peer Buddy and Target Child Demographics

Participant	Role	Chronological age	Gender	Race
Taisha	Peer Buddy	54	Female	African-American
Kayla	Peer Buddy	59	Female	Caucasian
Lila	Target Child	49	Female	African-American
Robert	Peer Buddy	59	Male	African-American
Leilani	Peer Buddy	57	Female	African-American
Anna	Target Child	49	Female	African-American
Eli	Peer Buddy	56	Male	African-American
Jakobe	Peer Buddy	59	`Male	African-American
Hunter	Target Child	53	Male	African-American
Alyssa	Peer Buddy	47	Female	African-American
Pierce	Peer Buddy	47	Male	African-American
Caleb	Target Child	45	Male	African-American

Table 3

Peer Buddy and Target Child Assessment Scores

Participant	Mullen			SSIS				ASQ:SE-2
	Age equivalent		ELC (%ile rank)	Social skills		Problem behavior		
	EL	RL		Category	%ile rank	Category	%ile rank	Score (Cut-off)
Taisha	45	55	50	Avg.	21	Avg.	80	20 (95)
Kayla	51	47	10	Above Avg.	84	Avg.	2	0 (95)
Lila	42	44	21	Well-below Avg.	1	Avg.	39	100* (85)
Robert	37	44	1	Well-below Avg.	<1	Well-above Avg.	>99	60 (95)
Leilani	48	39	8	Avg.	22	Avg.	16	15 (95)
Anna	37	36	1	Below Avg.	7	Avg.	77	150* (85)
Eli	53	59	66	Avg.	53	Avg.	39	0 (95)
Jakobe	50	53	18	Below Avg.	7	Well-above Avg.	95	90 (95)
Hunter	42	47	8	Well-below Avg.	<1	Above Avg.	89	125* (85)
Alyssa	45	37	6	Avg.	34	Avg.	11	20 (85)
Pierce	40	37	13	Avg.	40	Avg.	26	20 (85)
Caleb	35	31	38	Below Avg.	16	Avg.	58	30 (85)

Note. The Mullen Scales of Early Learning (Mullen, 2005), EL=Expressive Language, RL=receptive language, ELC=Early Learning Composite score, Social Skills Improvement System (SSIS; Gresham & Elliott, 2008), Ages and Stages Questionnaires: Social Emotional, Second Edition (ASQ:SE-2; Squires et al., 2015), * Scores above the cut-off indicate the child is at risk for social emotional delays and should be referred for further testing.

Table 4

Duration of Training Sessions

Participants	Stay		Play		Talk		Booster		Total time (Average)	
	Whole class	Triad	Whole class	Triad	Whole class	Triad	Whole Class	Triad	Whole Class	Triad
Taisha, Kayla, & Lila's Class	22:22	12:26	23:05	12:46	19:07	15:46	7:27	n/a	1:04:34* (21:31*)	40:58 (13:39)
Robert, Leilani, & Anna's Class	16:24	9:35	14:16	7:27	25:01	11:00	5:55	14:04	55:41* (18:34*)	28:02* (9:21*)
Eli, Jakobe, & Hunter's Class	14:32	8:47	15:12	7:45	21:25	8:16	n/a	n/a	51:09 (17:03)	24:48 (8:16)
Total time (Average)	53:18 (17:46)	30:48 (10:16)	52:33 (17:31)	27:58 (9:19)	1:05:33 (21:51)	35:02 (11:41)	13:22 (6:41)	14:01 (n/a)	2:51:24* (57:08*)	1:33:48* (31:16*)

Note. Hours: Minutes: Seconds, not applicable (n/a), * excludes booster training sessions.

Table 5

Description of Procedures for Generalization Across Children and Settings

	Across children		Across settings/activities	
	Programming	Data collection	Programming	Data collection
Peer buddy generalization	All children in the class participated in whole class training sessions. During whole class training sessions, the peer buddies and target children were assigned to the teacher's small group for practice.	Informal assessment: social validity questionnaire for teachers (Appendix N) Direct assessment: class-wide social engagement (Appendix L)	During both types of training sessions, the research discussed the importance of using strategies across the day. Examples and scenarios discussed, as well as role plays, included activities from different settings. In addition, the teacher provided a general reminder to the class at the start of all sessions.	Direct assessment: peer buddy implementation of stay, play, and talk strategies (Appendix I)
Target child generalization	All children in the class participated in whole class training sessions and could potentially use strategies with the target children.	Direct assessment: target child play engagement (Appendix J), target child initiations and responses (Appendix K), class-wide social engagement (Appendix L)	During both types of training sessions, the researcher discussed the importance of using strategies across the day. Examples and scenarios discussed included activities from different settings and activities.	Direct assessment: target child play engagement (Appendix J) and target child initiations and responses (Appendix K)

Table 6

Training Session Fidelity

Participants	Stay		Play		Talk		Booster		Average	
	Whole class	Triad	Whole class	Triad	Whole class	Whole class	Whole class	Triad	Whole class	Triad
Taisha, Kayla, & Lila	100%	100%	100%	100%	100%	100%	83.33%	n/a	100%*	100%
Robert, Leilani, & Anna	100%	87.50%	100%	88.89%	90%	88.89%	100%	100%	96.67%*	88.43%*
Eli, Jakobe, & Hunter	100%	100%	100%	100%	100%	100%	n/a	n/a	100%	100%
Average	100%	95.83%	100%	96.3%	96.67%	96.3%	91.67%	100%	98.89%	96.14%

Note. * excludes booster training sessions.

Table 7

Fidelity for Baseline, Buddy time, Generalization, and Maintenance Sessions

Peer buddy	Baseline		Buddy time		Generalization		Maintenance		Average	
	Fidelity (range)	% of sessions	Fidelity (range)	% of sessions	Fidelity (range)	% of sessions	Fidelity (range)	% of sessions	Fidelity (range)	% of sessions
Taisha	100%	100%	100%	33.33%	100%	33.33%	100%	33.33%	100%	50%
Kayla	100%	100%	91.67% (83-100%)	33.33%	100%	33.33%	100%	33.33%	97.92% (83-100%)	50%
Robert	100%	100%	94.44% (83-100%)	30%	100%	33.33%	100%	100%	98.61% (83-100%)	65.83%
Leilani	100%	100%	96.5% (86-100%)	40%	100%	33.33%	100%	100%	99.13% (86-100%)	68.33%
Eli	100%	100%	100%	40%	100%	44.44%	100%	33.33%	100%	54.44%
Jakobe	100%	100%	93% (86-100%)	40%	100%	44.44%	100%	33.33%	98.25% (86-100%)	54.44%
Alyssa	100%	100%	n/a	n/a	100%	40%	n/a	n/a	100%	70%
Pierce	100%	100%	n/a	n/a	100%	40%	n/a	n/a	100%	70%
Average (range)	100%	100%	95.94% (83-100%)	36.11%	100%	37.78%	100%	55.55%	99.13% (83-100%)	59%

Table 8

Inter-Observer Agreement for Peer Buddies' SPT Strategy Use

Peer buddy	Baseline		Buddy time		Generalization		Maintenance		Average	
	IOA (range)	% of sessions	IOA (range)	% of sessions	IOA (range)	% of sessions	IOA (range)	% of sessions	IOA (range)	% of sessions
Taisha	100%	40%	100%	33.33%	100%	33.33%	100%	33.33%	100%	35%
Kayla	100%	40%	100%	33.33%	91.67% (83.33-100%)	33.33%	88.89%	33.33%	96.03% (83.33-100%)	35%
Robert	100%	36.36%	92.59% (88.89-100%)	30%	100%	33.33%	100%	100%	97.98% (88.89-100%)	49.92%
Leilani	100%	36.36%	95.45% (88.89-100%)	40%	100%	33.33%	77.78%	100%	96.30% (77.78-100%)	52.42%
Eli	100%	35.71%	88.89% (77.78-100%)	40%	100%	33.33%	100%	33.33%	97.98% (77.78-100%)	35.59%
Jakobe	100%	35.71%	94.45% (88.89-100%)	40%	100%	33.33%	85.19%	33.33%	97.64% (85.19-100%)	35.59%
Alyssa	99.07% (94.44-100%)	35.29%	n/a	n/a	100%	40%	n/a	n/a	99.31% (94.44-100%)	37.65%
Pierce	100%	35.29%	n/a	n/a	94.45% (88.89-100%)	40%	n/a	n/a	98.61% (88.89-100%)	37.65%
Average (range)	99.85% (94.44-100%)	36.84%	94.82% (77.78-100%)	36.11%	98.61% (83.33-100%)	35%	91.98% (77.78-100%)	55.55%	97.88% (77.78-100%)	40.17%

Table 9

Inter-Observer Agreement for Target Children's Engagement in Play

Target Child	Baseline		Buddy time		Generalization		Maintenance		Average	
	IOA (range)	% of sessions	IOA (range)	% of sessions	IOA (range)	% of sessions	IOA (range)	% of sessions	IOA (range)	% of sessions
Lila	100%	40%	100%	33.33%	95.83% (87.5-100%)	33.33%	75%	33.33%	96.25% (75-100%)	35%
Anna	96.88% (87.5-100%)	36.36%	94.64% (87.5-100%)	35%	93.33% (80-100%)	33.33%	75%	100%	93.67% (75-100%)	51.17%
Hunter	95% (83.33-100%)	35.71%	92.19% (68.75-100%)	40%	95.83% (87.5-100%)	33.33%	100%	33.33%	94.71% (68.75-100%)	35.59%
Caleb	97% (87.5-100%)	35.29%	n/a	n/a	87.5% (75-100%)	40%	n/a	n/a	94.27% (75-100%)	37.65%
Average (range)	96.57% (83.33-100%)	36.84%	95.42% (68.75-100%)	36.11%	93.64% (75-100%)	35%	83.33% (75-100%)	55.55%	94.63% (68.75-100%)	40.17%

Table 10

Inter-Observer Agreement for Target Children's Initiations and Responses

Target Child	Baseline		Buddy time		Generalization		Maintenance		Average	
	IOA (range)	% of sessions	IOA (range)	% of sessions	IOA (range)	% of sessions	IOA (range)	% of sessions	IOA (range)	% of sessions
Lila	100%	40%	81.08% (66.67-88.89%)	33.33%	92.86% (88.89-100%)	33.33%	86.67%	33.33%	88.52% (66.67-100%)	35%
Anna	95% (80-100%)	36.36%	86.72% (75-100%)	35%	89.35% (82.35-100%)	33.33%	85.71%	100%	89.39% (75-100%)	51.17%
Hunter	93.31% (84.10-100%)	35.71%	82.42% (77.78-85.71%)	40%	100%	33.33%	80.95%	33.33%	90.48% (77.78-100%)	35.59%
Caleb	100%	35.29%	n/a	n/a	78% (72.73-83.33%)	40%	n/a	n/a	94.51% (72.73-100%)	37.65%
Average (range)	96.8% (84.10-100%)	36.84%	84.07% (66.67-100%)	36.11%	90.98% (72.73-100%)	35%	84.44% (80.95-86.67%)	55.55%	90.44% (66.67-100%)	40.17%

Table 11

Number and Type of Prompts Required by Peer Buddies During Buddy Time

Peer buddy	Stay			Play			Talk			Total
	G	V	P	G	V	P	G	V	M	
Taisha										0
Kayla	1									1
Robert	1				1			2		4
Leilani		1								1
Eli					1					1
Jakobe										0
Total	2	1			2			2		7

Note. G = gestural, V = verbal, P = physical, M = model.

Table 12

Number of Children the Target Children Played With

Target Child	Baseline			Intervention			Generalization						Maintenance		
							Before training			Following training					
	Mean	Range	PB	Mean	Range	PB	Mean	Range	PB	Mean	Range	PB	Mean	Range	PB
Lila	.60	0-1	0%	3.30	1.33-6	100%	2.3*	n/a	0%	7.13	4.5-9	75%	2	1-3	66.7%
Anna	1.42	0-4	0%	2.79	1-7	100%	1.88	1-3	16.8%	3.61	2.29-5.5	38%	2*	n/a	100%
Hunter	.57	0-3	7.1%	2.17	1-3	100%	1.06	0-1.75	12.5%	2	-	100%	3	2-5	100%
Caleb	.82	0-2	17.7%	n/a	n/a	n/a	2.16	1-4	37.7%	n/a	n/a	n/a	n/a	n/a	n/a

Note. PB represents the percentage of sessions in which the peer buddy was present during play, *Indicates only one session occurred.

Table 13

Class-wide Social Engagement Across Conditions

Participants	Percentage of children socially engaged					
	Baseline		Intervention		Maintenance	
	Obs. 1	Obs. 2	Obs. 1	Obs. 2	Obs. 1	Obs. 2
Ms. Sarah's class (Taisha, Kayla, & Lila)					54.98%	66.30%
Ms. Tasha's class (Robert, Leilani, & Anna)			75%	78.42%	77.41%	
Ms. Elaine's class (Eli, Jakobe, & Hunter)	48.12%	52.80%	81.60%		74.07%	
Ms. Becky's class (Alyssa, Pierce, and & Caleb)	49.87%	65.27%				

Note. Obs. = observations.

Table 14

Average Sociometric Ratings

Participant	Role	Pre-assessment			Post-assessment		
		Child rating	Class average (range)	N	Child rating	Class average (range)	N
Taisha	PB	2.47			1.88		
Kayla	PB	2.59	2.49 (2.18-2.71)	17	2.31	2.13 (1.56-2.44)	16
Lila	TC	2.71			2.31		
Robert	PB	2.33			1.43		
Leilani	PB	2.40	2.32 (2.07-2.47)	16	2	1.84 (1.43-2.57)	15
Anna	TC	2.27			1.43		
Eli	PB	2.27			2.42		
Jakobe	PB	1.87	1.95 (1.20-2.53)	15	2.08	2.01 (1.58-2.42)	12
Hunter	TC	1.27			2.08		

Note. Role = Peer Buddy (PB) or Target Child (TC), Child rating is the average rating given by children in the class, Class average is the average rating across all children in the class, N = number of children who participated in rating activity.

Table 15

Teacher's Social Validity Ratings

Social validity item	Rating				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The intervention was effective in increasing target child's social interactions with the peer buddies.					3
The intervention was effective in increasing the target child's social interactions with other peers in the classroom who did not participate in the study.					3
The teacher noticed the peer buddies using the Stay-Play-Talk strategies with the target child across the day.					3
The teacher noticed the peer buddies using the Stay-Play-Talk strategies with other children besides the target child.				1	2
The peer-implemented intervention Stay-Play-Talk is feasible and appropriate for increasing the social interactions of children.					3

Note. N is the number of teachers who selected the rating.

Table 16

Pre-Service Teacher's Average Rating of Target Children's Social Engagement

Target Child	Baseline rating			Intervention rating		
	Mean	Range	N	Mean	Range	N
Lila	1	--	12	2.83	1-4	12
Anna	1.04	1-2	12	3.08	2-5	12
Hunter	1.38	1-2	12	4.08	3-5	12

Note. 1 = poor, 2 = fair, 3 = average, 4 = above average, 5 = excellent.

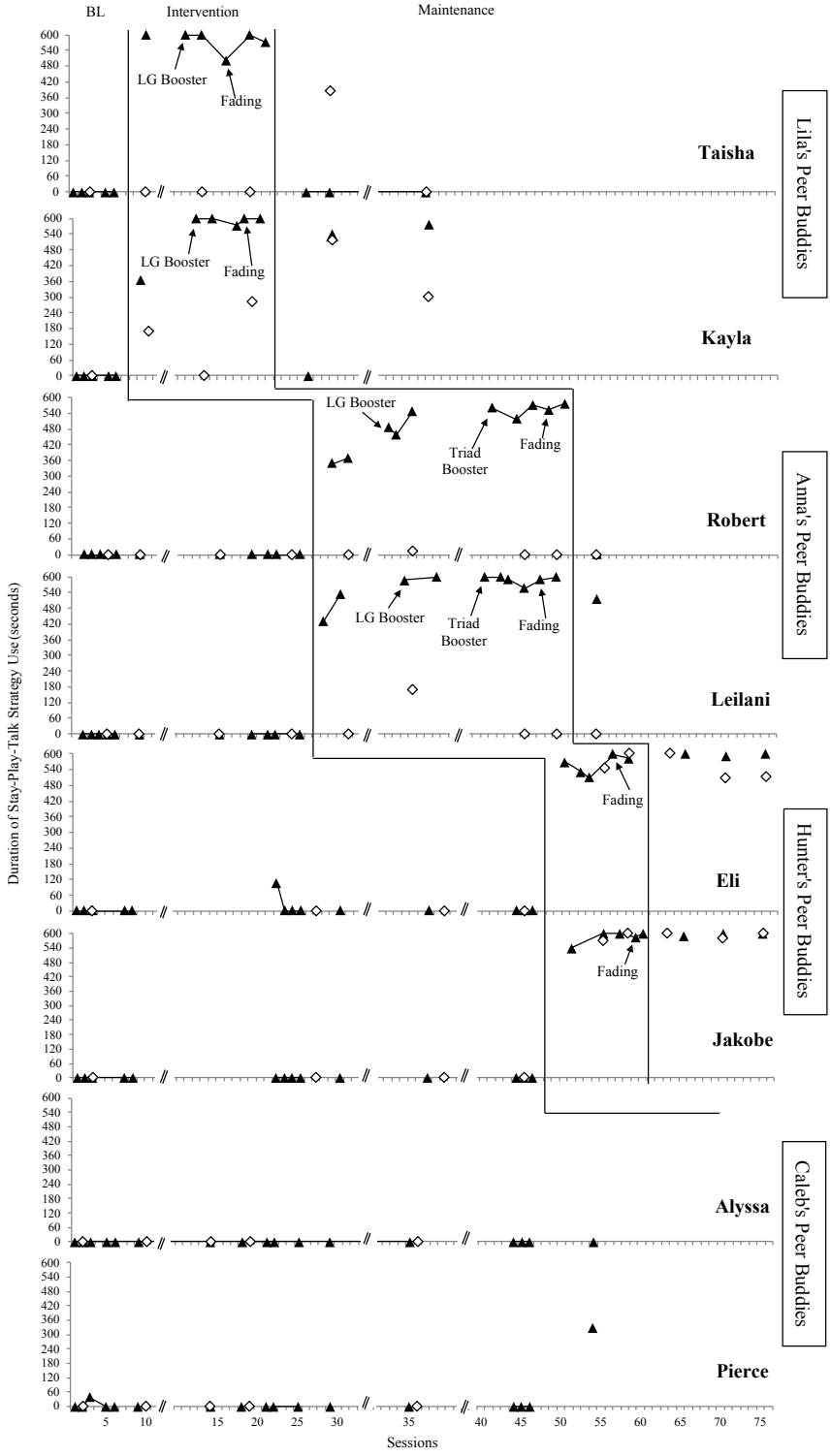


Figure 1. Duration of SPT strategy use by peer buddy. Black triangles represent buddy time, diamonds represent generalization sessions.

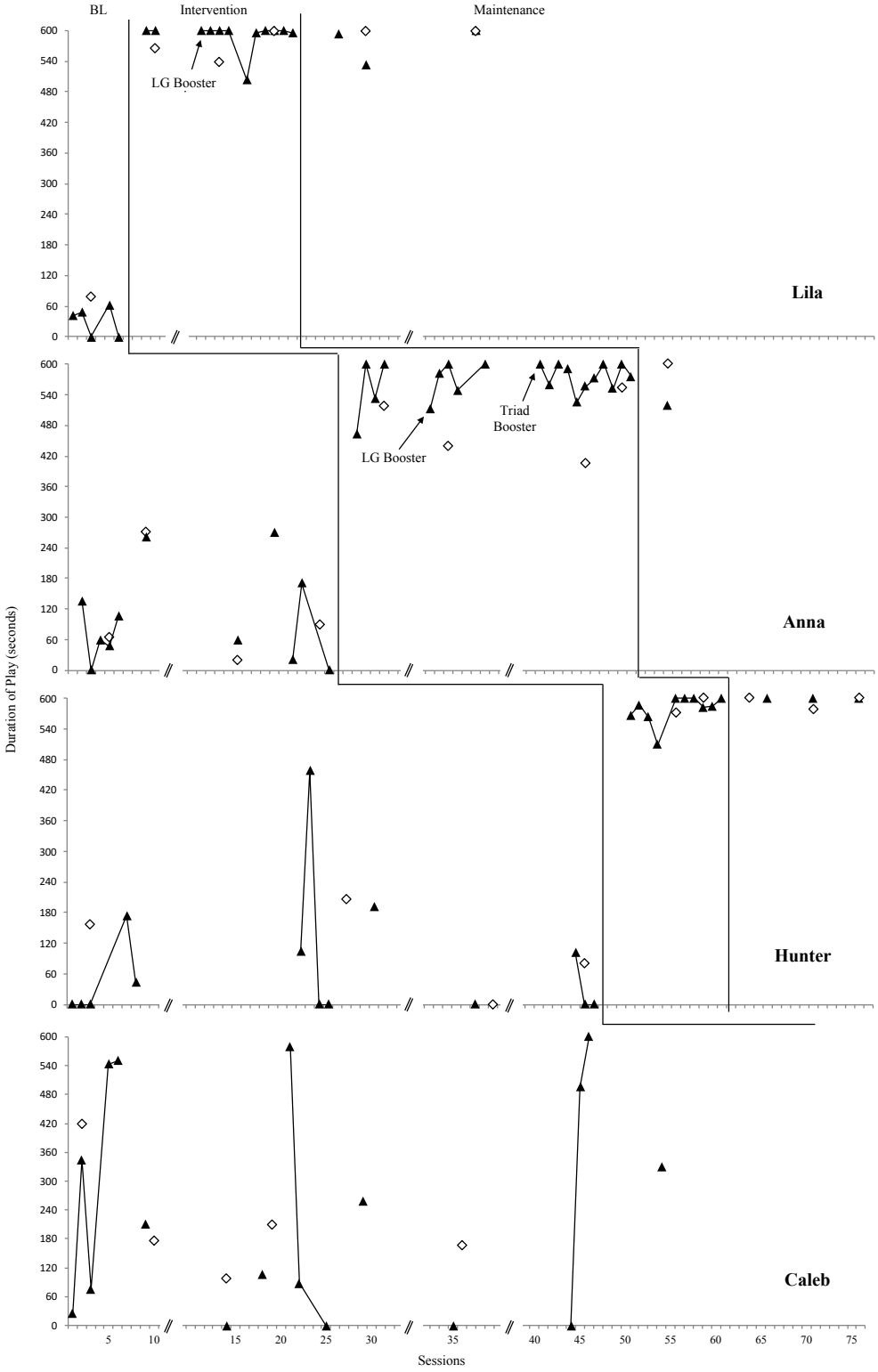


Figure 2. Duration of target child play with peer buddies and other children in the classroom. Black triangles represent buddy time, diamonds represent generalization sessions.

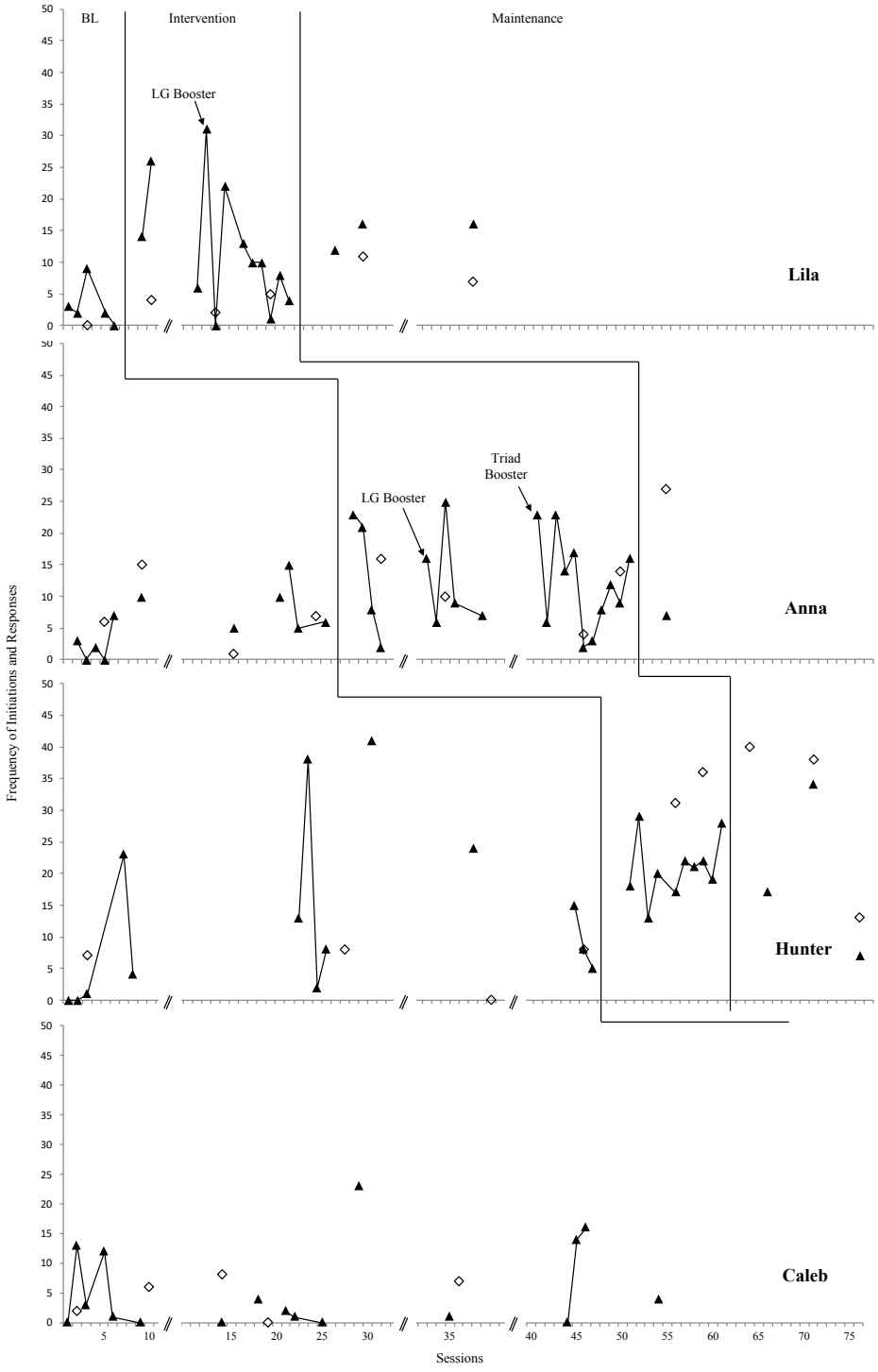


Figure 3. Frequency of target child initiations and responses with peer buddies and other children in the classroom. Black triangles represent buddy time, diamonds represent generalization sessions.

Appendix A

Teacher Nomination Form for Target Children

Teacher ID: _____ Date: _____

Please review the eligibility criteria for target children below and nominate 3 students who you feel meet the criteria and would benefit from being target children in this study.

Criteria:

1. Child is at least 36 months of age.
2. Child attends daycare regularly (no more than 6 absences in the last 30 days your center was open).
3. Child has not been picked up early more than 6 times in the last 30 days your center was open.
4. Child is very quiet and very rarely talks to peers (3 or fewer times in 15 minutes).

Target Child Nominations:

1. _____

2. _____

3. _____

Appendix B

Target Child Eligibility Criteria Checklist

Child ID: _____ Date: _____

Criteria		Check if meets criterion
1. Child is at least 36 months of age	Birth date: _____ Chronological age: _____	
2. Child attends daycare regularly (no more than 6 absences in the last 30 days center was open)	Number of absences: _____	
3. Child has not been picked up early more than 6 times in the last 30 days center was open	Number of times picked up early: _____	

To be completed by researcher following 10-minute observations:

	Date: Frequency:	Date: Frequency:	Date: Frequency:
Child talks to peers 3 or fewer times per 10-minute observation			

Appendix C

Teacher Nomination Form for Peer Buddies

Teacher ID: _____ Date: _____

Please review the eligibility criteria for peer buddies below and nominate 4 students who you feel meet the criteria listed below and would be good peer buddies for the study.

Criteria:

1. Child is at least 36 months of age.
2. Child attends daycare regularly (no more than 6 absences in the last 30 days your center was open).
3. Child has not been picked up early more than 6 times in the last 30 days your center was open.
4. Child talks to peers frequently.
5. Child can sit for at least 5 minutes during a small or large group lesson.
6. Child is likely to play in the same types of activities (with similar toys, in similar ways) as the target child

Peer Buddy Nominations:

1. _____

2. _____

3. _____

4. _____

Appendix D

Peer Buddy Eligibility Criteria Checklist

Child ID: _____ Date: _____

Criteria		Check if meets criterion
1. Child is at least 36 months of age	Birth date: _____ Chronological age: _____	
1. Child attends daycare regularly (no more than 6 absences in the last 30 days center was open)	Number of absences: _____	
2. Child has not been picked up early more than 6 times in the last 30 days center was open	Number of times picked up early: _____	

To be completed by researcher following observations:

3. Child talks to peers frequently (e.g. ≥ .5/minute on average across 3 observations)	Date: Rate:	Date: Rate:	Date: Rate:	
4. Child can sit for at least 5 minutes during a small and large group lessons	Date: Duration:	Date: Duration:	Date: Duration:	

Appendix E

Whole Class SPT Training Protocols

Whole Class SPT Training 1: STAY

Introduction	
Discuss the importance of playing with friends	• Read scripted story and discuss. • 'I am going to teach you how to play with your friends who may be a little shy.' • Introduction to 'buddy time' • We want to make sure no one in your class is playing by themselves.
Introduce STAY using visual	• Introduce the STAY visual. • All children repeat skill aloud. • Explain visual if needed.
Describe what it means to STAY	Child-friendly definition: • To make your friend feel happy, we need to stay close to them and watch what they are doing. If we are too far away, it is hard to play or talk to your friend. • You do not have to touch your friend to stay close, but if you want to tap your friend or pat your friend on the back, that is okay. • Sometimes your friend may stay in one place, like the art table, but sometimes he/she might move to a different place to play. I want you to stay with your friend, whatever they choose to do. • It is important to stay with your buddy the whole time during buddy time.
Examples of STAY (make sure to cover these within practice)	Examples: • If your friend sits at the art table or playing a game at the table, you should sit next to them at the table. If you friend gets up to leave the table, you should get up and follow them. • If your friend is playing on the carpet, you should sit next to your friend on the carpet. When your friend gets up and leaves the carpet, you should get up and leave the carpet too. • If your friend is in the dramatic play center, you should stand next to your friend in dramatic play. When your friend moves out of dramatic play, you should follow. • If your friend is trying to figure out where they want to play and are walking around the room, you should walk around the room with your friend.
Practice	

Modeling of STAY	• Trainer has teacher be the shy and move around the room (if X goes to the carpet, what should I do? I am going to follow. What if he/she moves to the table?). • Engage children by asking questions (did I STAY?, etc.).
Children practice STAY in small groups (with feedback from trainers)	• "Now it is your turn to practice with each other." • Sort children into small groups. Assign the target child and peer buddy to the group led by the teacher. • Direct one child to be the buddy and one to be the child who may be too shy to play. • Provide prompts as needed to child to move around the room and to the buddy if he/she does not follow. • Provide descriptive praise.
Conclusion	
Review of STAY, using the visual	• Remember, STAY means to: stay close to your friend, even if they move to a new place (refer to visual!).

Figure 1. Stay training protocol for the whole class training session.

Whole Class SPT Training 2: PLAY

Introduction	
Review the importance of playing with friends	• Read scripted story and discuss. • 'I am going to teach you how to play with your friends who may be a little shy.' • Review 'buddy time' • We want to make sure no one in your class is playing by themselves.
REVIEW STAY	• Show children the STAY visual. • Remember, last time we talked about staying with your friend. • When you STAY with your friend, you stay close to your friend, even if they move to a new place. If we are too far away, it is hard to play or talk to your friend. • Today, we are going to talk about what we do when we are staying without friend: we PLAY with our friends!
Introduce PLAY using visual	• Introduce the PLAY visual. • All repeat skill aloud. • Explain visual if needed.
Describe what it means to PLAY	Child-friendly definition: • To make your friend feel happy, we need to play with them. When we stay with our friends, we need to play with them too. • You can play with your friend by doing the same thing they are doing or playing with the same toy they are playing with. • You can also take turns with a toy or make something together. • Some things you can do to play with you friend are: taking turns with a game, building something together, drawing or painting a picture together, or playing pretend in dramatic play center. • ASK children if they can think of anything else they can play. • It is important to try to play with your buddy the whole time during buddy time.
Examples of PLAY (make sure to cover these within practice)	Examples: • Making something in the kitchen or cooking and washing dishes at dramatic play center. • Building with blocks together (building something together and building the same or similar things next to each other). • Make a train track or road together and then play with it. • Playing with cars/dinosaurs (any small manipulative) and doing the same actions as friend. • Play a game or start a puzzle together. • Create something together (make drawing, play with play dough, etc.) • Clean up a toy or game with a friend.

Practice	
Modeling of PLAY	• Trainer has teacher be the friend and pick something to play with (if X chooses to make a puzzle, what should I do? I am going to follow and help them make the puzzle. What if he/she decides to play with something else?). • Engage both children by asking questions (did I PLAY? etc.).
Children practice PLAY in small groups (with feedback from trainer)	• Sort children into small groups. Assign the target child and peer buddy to the group led by the teacher. • Direct one child to be the buddy and one to be the child who may be too shy to play. • Provide prompts as needed to child to move around the room and to the buddy if he/she does not follow and play with the buddy. • Provide descriptive praise.
Conclusion	
Review of PLAY, using the visual	• Remember, PLAY means to: play with your friend by doing the same thing they are doing or playing with the same toy they are playing with (refer to visual!)

Figure 2. Play training protocol for the whole class training session.

Whole Class SPT Training 3: TALK

Introduction	
Review the importance of playing with friends	• Read scripted story and discuss. • Remember, we are learning how to play with your friends who may be a little shy. • Quick reminder of 'buddy time' • We want to make sure no one in your class is playing by themselves.
Review STAY and PLAY	• Show children the STAY and PLAY visuals. • Remember, we have practiced staying and playing with your friend. • When you STAY with your friend, you stay close to your friend, even if they move to a new place. If we are too far away, it is hard to play or talk to your friend. • When you PLAY with your friend, you do the same thing they are doing or play with the same toy they are playing with. • Today, we are going to talk about talking to your friend when you play with them.
Introduce TALK using visual	• Introduce the TALK visual. • All children repeat skill aloud. • Explain visual if needed.
Describe what it means to TALK	Child-friendly definition: • When you stay and play with your friend, you should also talk to them. • They may be too shy to talk to you, but you will make them happy if you talk to them. • You can talk to your friend by asking your friend a question or telling them something. • You can ask your friend to play with you and ask if they want to do what you are doing. You can say, "Do you want to play with me? " • You can also ask your friend if you can play with them. • You can tell your friend what you are doing or ask what they are doing. • You can also show your friend something by saying, "Look what I made!" • You can also talk to your friend by saying something nice about your friend or about what they are doing. "I like your picture!" or by saying, "Good job!" • ASK children if they can think of other ways they can talk to their friends. • It is important to try to play with your buddy the whole time during buddy time.

Examples of TALK (make sure to cover these within practice)	Examples: • Greeting another child. • Gaining attention by saying child's name. • Commenting positively on friend's creations or actions. • Asking to play. • Asking the other child to play with them. • Make play suggestions. • Providing praise to friends. • Asking for a toy.
Practice	
Modeling of TALK	• Trainer has teacher pick an activity (play) and models different ways to talk to friends (pointing out what she said while modeling).
Children practice TALK in small groups (with feedback from trainer)	• Sort children into small groups. Assign the target child and peer buddy to the group led by the teacher. • Direct one child to be the buddy and one to be the child who may be too shy to play. • Provide prompts as needed to child to move around the room and to the buddy if he/she does not follow, play with the buddy, and talk to the buddy. • Provide descriptive praise.
Conclusion	
Review of TALK, using the visual	• Remember, TALK means to: ask your friend a question or tell them something (refer to visual!)

Figure 3. Talk training protocol for the whole class training session.

Appendix F

Triad SPT Training Protocols

Triad SPT Training 1: STAY

Introduction	
Review the importance of playing with friends	• Read scripted story and discuss. • Remember, we are learning how to play with your friends who may be a little shy. • Quick reminder of 'buddy time' • We want to make sure no one in your class is playing by themselves.
Review what it means to STAY	Child-friendly definition: • To make your friend feel happy, we need to stay close to them and watch what they are doing. If we are too far away, it is hard to play or talk to your friend. • You do not have to touch your friend to stay close, but if you want to tap your friend or pat your friend on the back, that is okay. • Sometimes your friend may stay in one place, like the art table, but sometimes he/she might move to a different place to play. I want you to stay with your friend, whatever they choose to do. • It is important to stay with your buddy the whole time during buddy time.
Practice	
Peer buddies practice STAY with the trainer	• Trainer pretends to be the friend and moves around room, prompting child to follow if needed and praising when appropriate. • Do this with each child separately. • Engage other child by asking questions (did he/she STAY?, etc.). • Provide descriptive praise.
Peer buddies practice STAY with the target child (with feedback from trainer)	• "Now it is your turn to practice with each other." • Direct one child to be the buddy and one to be the child who may be too shy to play. • Provide prompts as needed to child to move around the room and to the buddy if he/she does not follow. • Provide descriptive praise.
Examples of STAY (make sure to cover these within practice)	Examples: • If your friend sits at the art table or playing a game at the table, you should sit next to them at the table. If you friend gets up to leave the table, you should get up and follow them.

	• If your friend is playing on the carpet, you should sit next to your friend on the carpet. When your friend gets up and leaves the carpet, you should get up and leave the carpet too. • If your friend is in the dramatic play center, you should stand next to your friend in dramatic play. When your friend moves out of dramatic play, you should follow. • If your friend is trying to figure out where they want to play and are walking around the room, you should walk around the room with your friend.
Conclusion	
Review of STAY, using the visual	• Remember, STAY means to: stay close to your friend, even if they move to a new place (refer to visual!). • Brief meeting with peer buddies after training session with class is complete: introduce token system (some days, I will tell you it is buddy time, and you will try to play with your buddy the way I am teaching you. After, we will look to see if you were able to play with your buddy during buddy time. You can earn a prize from the treasure box!).

Figure 1. Stay training protocol for the triad training session.

Triad SPT Training 2: PLAY

Introduction	
Review the importance of playing with friends	• Read scripted story and discuss. • Remember, we are learning how to play with your friends who may be a little shy. • Quick reminder of 'buddy time' We want to make sure no one in your class is playing by themselves.
REVIEW STAY	• Show children the STAY visual. • Remember, last time we talked about staying with your friend. • When you STAY with your friend, you stay close to your friend, even if they move to a new place. If we are too far away, it is hard to play or talk to your friend. • Today, we are going to talk about what we do when we are staying without friend: we PLAY with our friends!
Review what it means to PLAY	Child-friendly definition: • To make your friend feel happy, we need to play with them. When we stay with our friends, we need to play with them too. • You can play with your friend by doing the same thing they are doing or playing with the same toy they are playing with. • You can also take turns with a toy or make something together. • Some things you can do to play with you friend are: taking turns with a game, building something together, drawing or painting a picture together, or playing pretend in dramatic play center. • ASK children if they can think of anything else they can play. • It is important to try to play with your buddy the whole time during buddy time.
Examples of PLAY (make sure to cover these within practice)	Examples: • Making something in the kitchen or cooking and washing dishes at dramatic play center. • Building with blocks together (building something together and building the same or similar things next to each other). • Make a train track or road together and then play with it. • Playing with cars/dinosaurs (any small manipulative) and doing the same actions as friend. • Play a game or start a puzzle together. • Create something together (make drawing, play with play dough, etc.) • Clean up a toy or game with a friend.
Practice	
Peer buddies practice PLAY with the trainer	• Trainer pretends to be the friend and chooses something to play with, prompting child to play if needed and praising when appropriate.

	• Do this with each child separately. • Engage other child by asking questions (did he/she PLAY?, etc.). • Provide descriptive praise.
Peer buddies practice PLAY with the target child (with feedback from trainer)	• "Now it is your turn to practice with each other." • Direct one child to be the buddy and one to be the child who may be too shy to play. • Provide prompts as needed to child to pick something to play with and for the other child to play with the child. • Provide descriptive praise.
Conclusion	
Review of PLAY, using the visual	• Remember, PLAY means to: play with your friend by doing the same thing they are doing or playing with the same toy they are playing with (refer to visual!)

Figure 2. Play training protocol for the triad training session.

Triad SPT Training 3: TALK

Introduction	
Review the importance of playing with friends	• Read scripted story and discuss. • Remember, we are learning how to play with your friends who may be a little shy. • Quick reminder of 'buddy time' • We want to make sure no one in your class is playing by themselves.
Review STAY and PLAY	• Show children the STAY and PLAY visuals. • Remember, we have practiced staying and playing with your friend. • When you STAY with your friend, you stay close to your friend, even if they move to a new place. If we are too far away, it is hard to play or talk to your friend. • When you PLAY with your friend, you do the same thing they are doing or play with the same toy they are playing with. • Today, we are going to talk about talking to your friend when you play with them.
Review what it means to TALK	Child-friendly definition: • When you stay and play with your friend, you should also talk to them. • They may be too shy to talk to you, but you will make them happy if you talk to them. • You can talk to your friend by asking your friend a question or telling them something. • You can ask your friend to play with you and ask if they want to do what you are doing. You can say, "Do you want to play with me? " • You can also ask your friend if you can play with them. • You can tell your friend what you are doing or ask what they are doing. • You can also show your friend something by saying, "Look what I made!" • You can also talk to your friend by saying something nice about your friend or about what they are doing. "I like your picture!" or by saying, "Good job!" • ASK children if they can think of other ways they can talk to their friends. • It is important to try to play with your buddy the whole time during buddy time.
Examples of TALK (make sure to cover these within practice)	Examples: • Greeting another child. • Gaining attention by saying child's name.

	• Commenting positively on friend's creations or actions. • Asking to play. • Asking the other child to play with them. • Make play suggestions. • Providing praise to friends. • Asking for a toy.
Practice	
Peer buddies practice TALK with the trainer	• Trainer has children practice talking to the trainer (can be during same play activity or another of their choosing). • Trainer should make sure each child practices talking a few different times. • Provide descriptive praise.
Peer buddies practice TALK with the target child (with feedback from trainer)	• "Now it is your turn to practice with each other." • Direct one child to be the buddy and one to be the child who may be too shy to play. • Provide prompts as needed to child to talk to the other child. • Ensure each child takes on the role of both the peer buddy and target child. • Provide descriptive praise.
Conclusion	
Review of TALK, using the visual	• Remember, TALK means to: ask your friend a question or tell them something (refer to visual!)

Figure 3. Talk training protocol for the triad training session.

Appendix G

Booster Training Protocols

Whole Class SPT Training: Booster

Introduction	
Discuss the importance of playing with friends	• Read scripted story and discuss. • Reminder of 'buddy time'
Review	
Reminder of STAY	• Show STAY visual Child-friendly definition: • To make your friend feel happy, we need to stay close to them and watch what they are doing. If we are too far away, it is hard to play or talk to your friend. • You do not have to touch your friend to stay close, but if you want to tap your friend or pat your friend on the back, that is okay. • Sometimes your friend may stay in one place, like the art table, but sometimes he/she might move to a different place to play. I want you to stay with your friend, whatever they choose to do. • It is important to stay with your buddy the whole time during buddy time.
Reminder of PLAY	• Show PLAY visual Child-friendly definition: • To make your friend feel happy, we need to play with them. When we stay with our friends, we need to play with them too. • You can play with your friend by doing the same thing they are doing or playing with the same toy they are playing with. • You can also take turns with a toy or make something together. • Some things you can do to play with you friend are: taking turns with a game, building something together, drawing or painting a picture together, or playing pretend in dramatic play center. • ASK children if they can think of anything else they can play. • It is important to try to play with your buddy the whole time during buddy time.
Reminder of TALK	• Show TALK visual Child-friendly definition: • When you stay and play with your friend, you should also talk to them. • They may be too shy to talk to you, but you will make them happy if you talk to them. • You can talk to your friend by asking your friend a question or telling them something.

	• You can ask your friend to play with you and ask if they want to do what you are doing. You can say, "Do you want to play with me? " • You can also ask your friend if you can play with them. • You can tell your friend what you are doing or ask what they are doing. • You can also show your friend something by saying, "Look what I made!"
Practice	
Modeling of STAY, PLAY, and TALK	• Trainer has teacher pick an activity (play) and models different ways to stay, play, and talk to friends (pointing out what she said while modeling).
Conclusion	
Review of STAY-PLAY-TALK, using the visual	• Remember, STAY means to: stay close to your friend, even if they move to a new place (refer to visual!). • Remember, PLAY means to: play with your friend by doing the same thing they are doing or playing with the same toy they are playing with (refer to visual!) • Remember, TALK means to: ask your friend a question or tell them something (refer to visual!)

Figure 1. Training protocol for the whole class booster training session.

Triad SPT Training: Booster

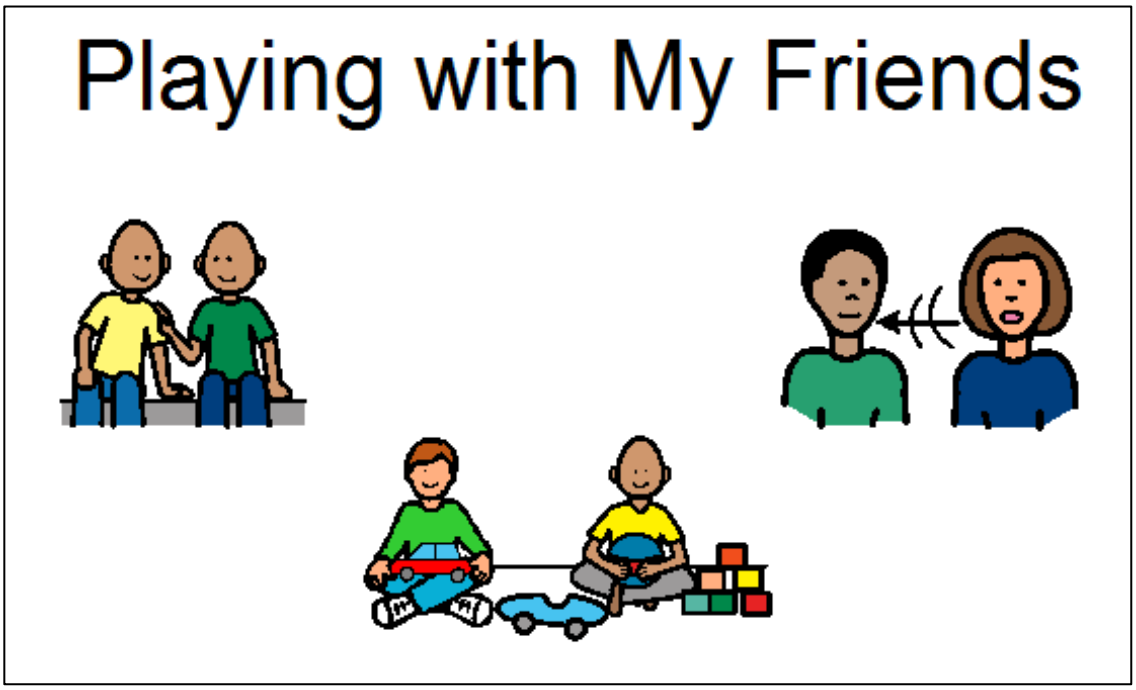
Introduction	
Discuss the importance of playing with friends	• Read scripted story and discuss. • Reminder of 'buddy time'
Review	
Reminder of STAY	• Show STAY visual Child-friendly definition: • To make your friend feel happy, we need to stay close to them and watch what they are doing. If we are too far away, it is hard to play or talk to your friend. • You do not have to touch your friend to stay close, but if you want to tap your friend or pat your friend on the back, that is okay. • Sometimes your friend may stay in one place, like the art table, but sometimes he/she might move to a different place to play. I want you to stay with your friend, whatever they choose to do. • It is important to stay with your buddy the whole time during buddy time.
Reminder of PLAY	• Show PLAY visual Child-friendly definition: • To make your friend feel happy, we need to play with them. When we stay with our friends, we need to play with them too. • You can play with your friend by doing the same thing they are doing or playing with the same toy they are playing with. • You can also take turns with a toy or make something together. • Some things you can do to play with you friend are: taking turns with a game, building something together, drawing or painting a picture together, or playing pretend in dramatic play center. • ASK children if they can think of anything else they can play. • It is important to try to play with your buddy the whole time during buddy time.
Reminder of TALK	• Show TALK visual Child-friendly definition: • When you stay and play with your friend, you should also talk to them. • They may be too shy to talk to you, but you will make them happy if you talk to them. • You can talk to your friend by asking your friend a question or telling them something. • You can ask your friend to play with you and ask if they want to do what you are doing. You can say, "Do you want to play with me? "

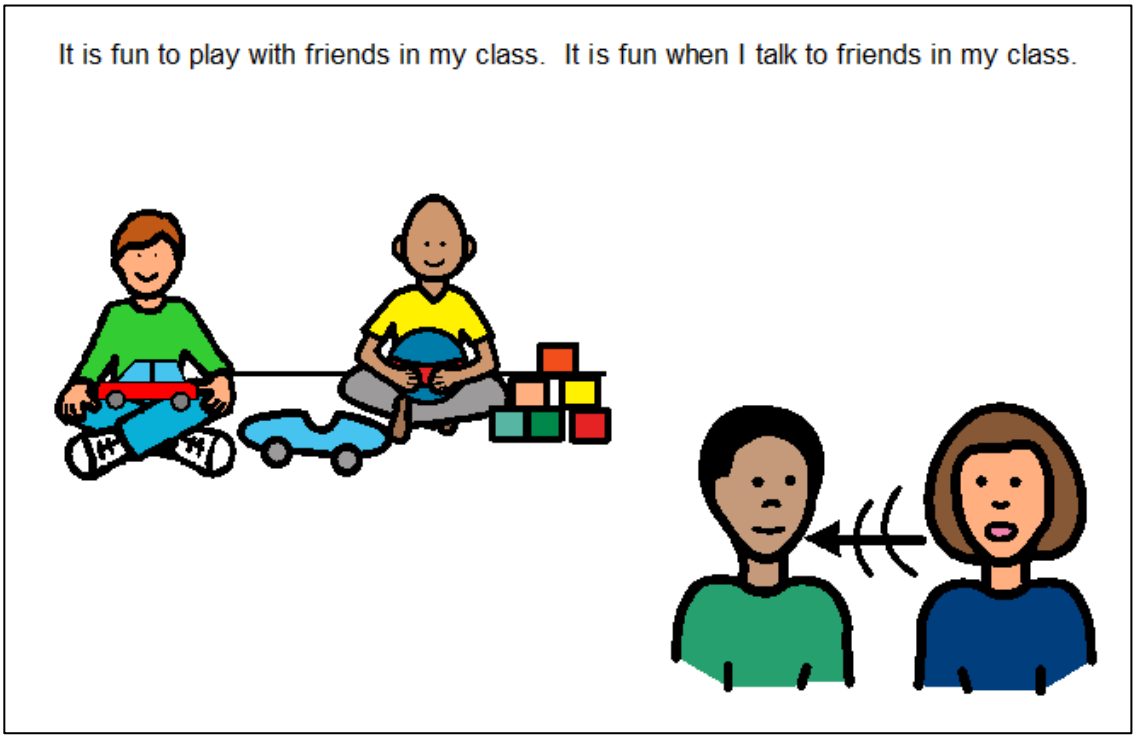
	• You can also ask your friend if you can play with them. • You can tell your friend what you are doing or ask what they are doing. • You can also show your friend something by saying, "Look what I made!"
Practice	
Peer buddies practice STAY, PLAY, and TALK with the target child (with feedback from trainer)	• "Now it is your turn to practice with each other." • Direct one child to be the buddy and one to be the child who may be too shy to play. • Provide prompts as needed to child to talk to the other child. • Ensure each child takes on the role of both the peer buddy and target child. • Provide descriptive praise.
Conclusion	
Review of STAY-PLAY-TALK, using the visual	• Remember, STAY means to: stay close to your friend, even if they move to a new place (refer to visual!). • Remember, PLAY means to: play with your friend by doing the same thing they are doing or playing with the same toy they are playing with (refer to visual!) • Remember, TALK means to: ask your friend a question or tell them something (refer to visual!)

Figure 2. Training protocol for the triad booster training session.

Appendix H

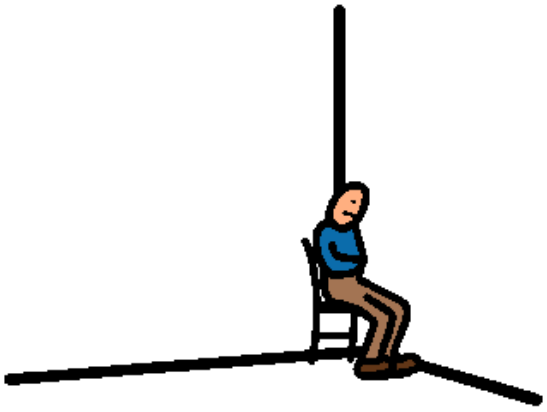
SPT Visuals



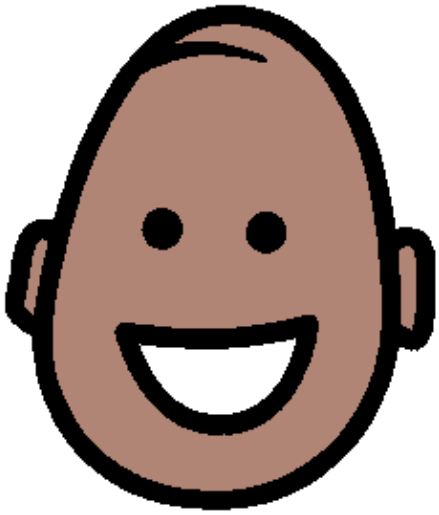


Sometimes, friends in my class may be too shy to play with me or talk to me.

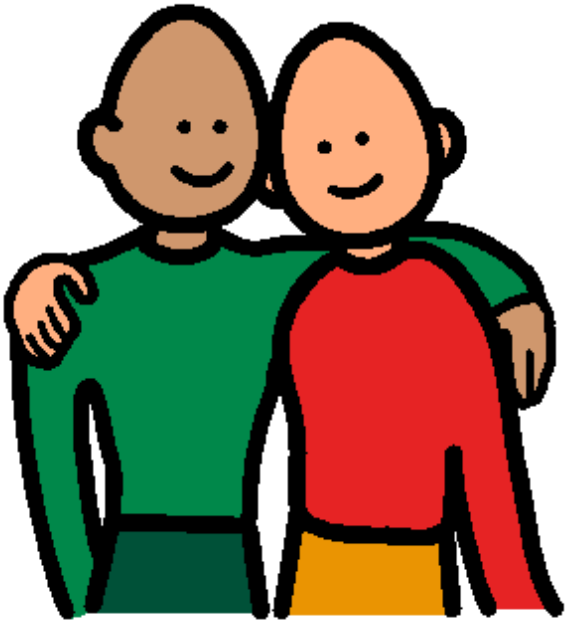
This might make them feel sad and lonely.



I can make my friend feel happy if I play with them and talk to them.



I like making my friend feel happy.



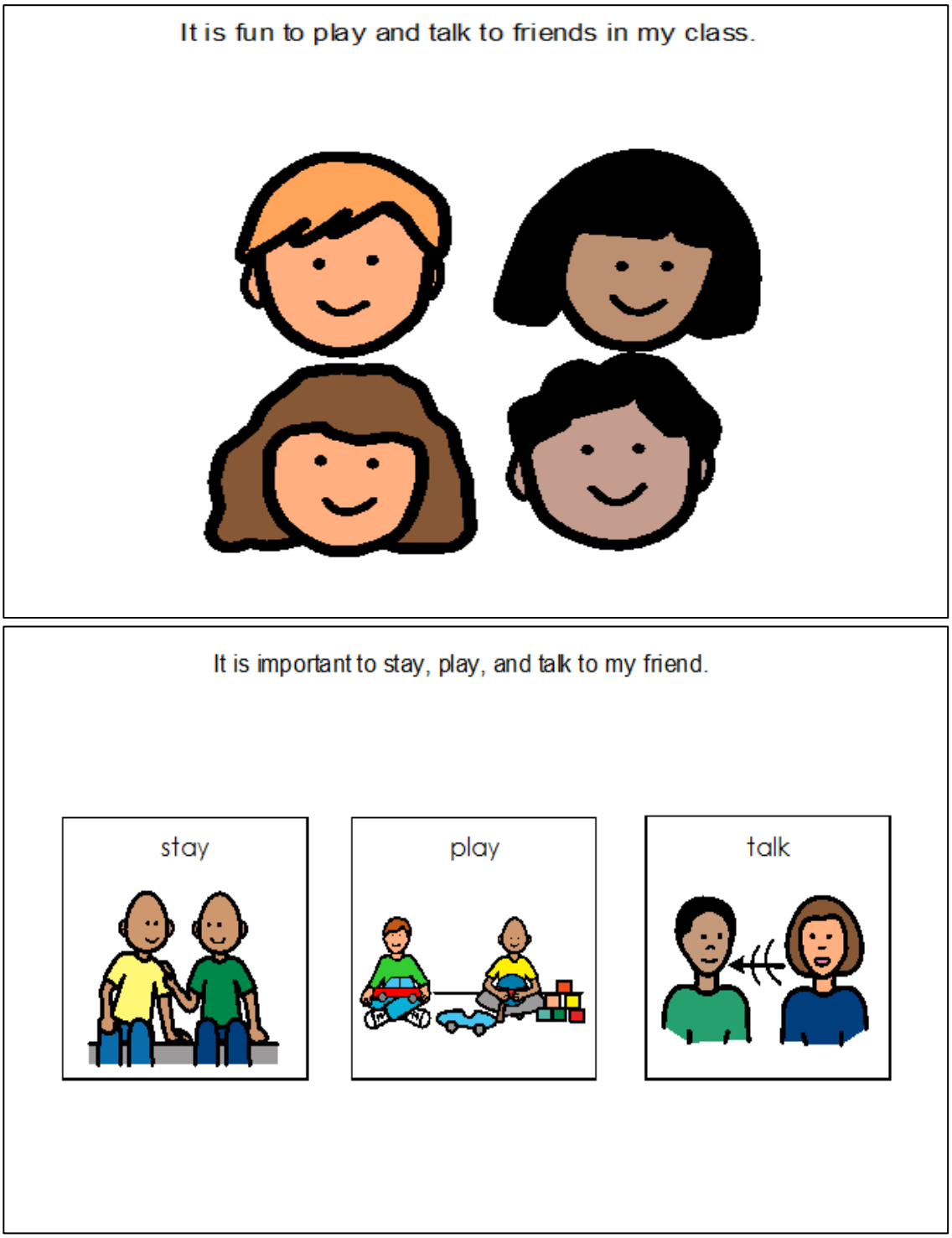


Figure 1. Scripted story.

Figure 2. Visuals representing the stay, play, and talk strategies.

Figure 3. SPT checklist.

Reliability session:

☐ Yes

☐ No

Appendix I

Peer Buddy Implementation of Strategies

Child ID: ________________ Video File: ________________

Date: ________________ Data collector: ________________

STAY-PLAY				TALK		Y/N
Stay prompt	Play prompt	Times		Talk prompt	Examples	
N G V P	N G V P	Start:	End:	N G V M	1.	
		Duration:		N G V M	2.	
N G V P	N G V P	Start:	End:	N G V M	1.	
		Duration:		N G V M	2.	
N G V P	N G V P	Start:	End:	N G V M	1.	
		Duration:		N G V M	2.	
N G V P	N G V P	Start:	End:	N G V M	1.	
		Duration:		N G V M	2.	
N G V P	N G V P	Start:	End:	N G V M	1.	
		Duration:		N G V M	2.	
N G V P	N G V P	Start:	End:	N G V M	1.	
		Duration:		N G V M	2.	
N G V P	N G V P	Start:	End:	N G V M	1.	
		Duration:		N G V M	2.	
N G V P	N G V P	Start:	End:	N G V M	1.	
		Duration:		N G V M	2.	

Key: N = none; G = gestural; V = verbal; P = physical; M = model

Total complete: /

Activity: ________________________________

Figure 1. Peer buddy implementation of strategies data collection form.

Data Storage Plan
You will be given a video of the child to conduct Interobserver Agreement (IOA) checks. Videos will be on an external hard drive in my office (304E). The external hard drive will have a folder with your ID on videos that need to be watched (ex. D: incomplete IOA) and also a folder that you will move videos to after you have completed IOA (ex. D: IOA complete). In the incomplete folder will also be a word file that will have a description of what both the target child and peer buddy are wearing in the video (so you can code the correct children). Once the Peer Buddy Intervention Fidelity Data Collection form is complete, please return the form to me (there will be a folder labeled IOA on my desk).

Coding
Before coding, please complete the top portion of the form. The Child ID will be provided for you in the word file that also contains a description of the child. Your word file will have the video name, corresponding description of the peer buddy and target child for the video you will be watching, and the child ID for each video you are assigned. The Date is the date you are completing IOA. The Video File is the file name I created and have saved the video under. The Data Collector is you ID. You will also check 'yes' for Reliability session in the top right corner.

There are 2 categories you will be coding for the Peer Buddies' use of stay-play-talk:

1. STAY-PLAY (Duration of the stay-play-talk episode)
2. TALK (Examples of Peer Buddy talk directed toward the Target Child)

1. STAY-PLAY (Duration of the stay-play-talk episode)

The peer buddy must be in the same center or area of the classroom as the target child. Depending on the classroom, proximity (within 3 feet) might be needed if centers are not clearly defined. This will be decided once the study begins, and the definition that will be used will be indicated in the word file. If the 'stay' requirement is being met, begin observing for play.

Play can be in the form of parallel, associative, or cooperative play (see the definitions of these types of play below). Broad examples include: the peer buddy engaging with the same type of toy as the target child in the same way; the peer buddy playing with a different toy than the target child, but in the same or similar way; the peer buddy and target child engaging with toys within the same play scheme; or the peer buddy is sharing and exchanging toys with the target child. Play CAN NOT be in the form of onlooker or solitary independent play (see definitions below).

Onset:

- As soon as the peer buddy meets the requirements for 'play,' the time indicated on the video file is recorded in the Start time portion of the form.
- The peer buddy and target child can move between the different types of play and the duration would continue, as long as there is not a break in play for longer than 5 seconds.

Offset:

- When the peer buddy no longer meets the requirements for 'play' for longer than 5 seconds, the time indicated on the video file is recorded in the End time portion of the form.
- The episode can end when the 'play' requirement is no longer met **OR** if the peer buddy and target child no longer meet the definition of stay (i.e., are no longer in the same center area).

Examples:

- The peer buddy and target child are both playing with blocks, building towers next to each other on the carpet.
- The target child is playing with cars, the peer buddy has a block and is pretending it is a car, following/copying the actions of the target child.
- The peer buddy and target child are in the dramatic play center and the peer buddy is 'washing dishes' and the target child is 'cooking' in the kitchen in the dramatic play center.
- The peer buddy and target child take turns playing a game at a table.
- The peer buddy gives or exchanges a play dough tool with target child while sitting at the art table.

Non-examples:

- The peer buddy and target child are both playing with blocks, but the peer buddy is outside of the center area (e.g. off of the center time rug)
- The peer buddy is in the dramatic play center and the target child is leaning over a shelf (into another center) or standing outside the center area
- The peer buddy and target child are both at the writing center, but sitting at different tables/desks
- The peer buddy is building a tower with blocks, while the target child is lining up cars (unless it is clear that they are building a garage or road to put cars on).
- The peer buddy is painting, while the target child is playing with play dough.
- The peer buddy and target child are playing two different games.
- One child takes/grabs a toy from another child (this could happen within an example of play, but in itself, does not provide an example of play).

IMPORTANT: When the 'play' definition is no longer met, the stay-play-talk episode is over, whether or not the 'talk' component occurred. When the peer buddy is no longer meeting any of the definitions of play described above, move to the next line on the form. Begin recording duration again when the definition for play is again met. DO NOT code 'talk' if the 'play' component is not being met.

*At the conclusion of the video, the data collector should calculate the duration of each episode by subtracting the Start time from the End time. The duration should be recorded in minutes and seconds.

Decision Rules

- If a child is in the process of getting materials (i.e., getting blocks from the shelf and bringing them to carpet; getting food from cabinet and bringing it to the table), this would still be considered play. Do not consider this a break from play. There is no need to count 5 seconds and then stop, unless the child begins to do something else and it does not seem like they are looking for materials anymore.
- If the peer buddy walks away and is in the process of coming back to meet 'stay' requirements when the 5 second count is over, this can still be considered part of the same play episode. Do not code as the same play episode if the peer buddy begins to come back to the target child after the 5 second count is over.
- When at the art table, drawing pictures/creating (with play dough, drawing, painting, etc.) is considered play if the children seem to be looking at each other's work and/or creating similar things. Most likely, the children will be using the same material, but this does not have to be true in all cases (one child is drawing and one is painting, but they are looking at each other's work and making the same thing).
- If the children worked collaboratively to create something and are playing with it (a train track, road for cars out of blocks), do not assume the play requirement is still being met. If the children are playing with the creation, but not meeting the requirements for play, do not code play. For example, a long train track is made, and one child is playing at one end and the other child is playing at the other end. They are not looking at each other or engaging in parallel play. This no longer meets play requirements.
- Cleaning up an area or game is coded as play, as long as both the target child and peer buddy are cleaning together.
- As long as one of the children does not walk away or begin to play with another toy, a board game continues to be counted as one episode, as long as both children are taking turns.
- Begin coding play when the peer buddy makes an attempt to get the target child to respond/play, even if the target child does not respond immediately. The peer buddy must be looking to see what the target child is doing and cannot go back to playing separately for this to count as play.
- For the onset of parallel play, both children need to have the toys/materials in their hands.
- If children are at a table or at a sensory table, stay can only be coded if the children are next to or across width-wise from each other. For example, the children cannot be at opposite ends of the table length-wise.
- If teacher interrupts play to talk to target child or another child (if there are only 2 children present), stop duration code. Begin duration again when the teacher and child stop talking and the child begins playing again.
- If children are walking to a new center (and are not engaging in pretend play on the way), this is meeting the stay requirement, but is not meeting play. Stop coding play after 5 seconds and begin coding when the children begin playing at new center.

Play Definitions (Parten, 1932)

(Non-Example) Onlooker—The child spends most of his time watching the other children play. He often talks to the children whom he is observing, asks questions, or gives suggestions, but does not overtly enter into the play himself. This type differs from the

unoccupied in that the onlooker is definitely observing particular groups of children rather than anything that happens to be exciting. The child stands or sits within speaking distance of the group so that he can see and hear everything that takes place.
(Non-Example) Solitary independent play—The child plays alone and independently with toys that are different from those used by the children within speaking distance and makes no effort to get close to other children. He pursues his own activity without reference to what others are doing.
Parallel activity—The child plays independently, but the activity he chooses naturally brings him among other children. He plays with toys that are like those which the children around him are using, but he plays with the toy as he sees fit, and does not try to influence or modify the activity of the children near him. He plays *beside* rather than *with* the other children.
Associative play—The child plays with other children. The conversation concerns the common activity; there is a borrowing and loaning of play material; following one another with trains or wagons; mild attempts to control which children may or may not play in the group. All the members engage in similar if not identical activity. The children do not subordinate their individual interests to that of the group; instead each child acts as he wishes.
Cooperative or organized supplementary play—The child plays in a group that is organized for the purpose of making some material product, or of striving to attain some competitive goal, or of dramatizing situations of adult and group life, or of playing formal games. There is a marked sense of belonging or of not belonging to the group. The control of the group situation is in the hands of one or two of the members who direct the activity of the others. The goal as well as the method of attaining it necessitates a division of labor, taking of different roles by the various group members and the organization of activity so that the efforts of one child are supplemented by those of another.

2. TALK (Examples of Peer Buddy Talk Directed Toward the Target Child)

The peer buddy must engage in at least 2 **separate** communicative attempts with the target child during the same stay-play-talk episode. These can include, but are not limited to, a greeting to the target child, asking the target child a question, requesting toys/items/or information from the target child, commenting on something the target child is doing, and responding to a comment or question from the target child.

The two attempts can either be signified by a shift in conversation or type of attempt or a 3 second pause between communicative attempts. For example, the peer buddy might ask the target child a question and the child doesn't respond so the peer buddy tries again by switching topics/attempts OR the peer buddy makes an attempt, waits 3 seconds, and then makes the same attempt again. Both of these would signify 2 separate communicative attempts. Two communicative attempts should be recorded in the 'talk' portion of the data collection form. What the peer buddy says should be written down in abbreviated/approximated form. Once two attempts are recorded, you may stop recording the communicative attempts for that episode.

Examples:

- The peer buddy saying 'hello' or 'hi' to the target child

- The peer buddy saying the target child's name to gain attention
- The peer buddy asking the target child for a toy ("Can I have the car?") or asking what the target child is doing/playing with ("What are you playing with?" "What are you doing?")
- The peer buddy making a play suggestion to the target child ("Let's play cars together.")
- The peer buddy commenting on the target child's block tower ("Look how tall your tower is!")

Non-Examples:

- The peer buddy does not talk to the target child
- The target child asks the peer buddy a question and the peer buddy does not respond
- The peer buddy yells at the target child or exhibits other forms of verbal aggression

Complete or Incomplete Stay-Play-Talk Episodes

After watching and coding the video for the stay-play and talk categories, you will record whether or not a complete episode of stay-play-talk occurred. A complete episode occurs when the peer buddy has played with the target child and made two separate communicative attempts. In other words, the 'play' portion of the form must have duration recorded, and the 'talk' portion of the form must have 2 communicative attempts recorded. If the episode meets these requirements, record yes by writing 'Y.' If the episode does not meet the requirements, record no by writing 'N.' At the bottom of the column, record the number of complete episodes and the total number of possible episodes.

Figure 2. Codes and training manual for peer buddies' use of stay-play-talk.

Appendix J

Target Child Play Duration

Reliability session:
☐ Yes
☐ No

Child ID: _____ Video File: _____

Date: _____ Data collector: _____

PLAY		Number of children the target child is playing with	PB Playing
Start time:	End time:		Y N
Duration:			
Start time:	End time:		Y N
Duration:			
Start time:	End time:		Y N
Duration:			
Start time:	End time:		Y N
Duration:			
Start time:	End time:		Y N
Duration:			
Start time:	End time:		Y N
Duration:			
Start time:	End time:		Y N
Duration:			
Start time:	End time:		Y N
Duration:			

Activity: _____

Figure 1. Target child play duration data collection form.

Target Child's Duration of Play

Data Storage Plan
You will be given a video of the child to conduct Interobserver Agreement (IOA) checks. Videos will be on an external hard drive in my office (304E). The external hard drive will have a folder with your ID on videos that need to be watched (ex. D: incomplete IOA) and also a folder that you will move videos to after you have completed IOA (ex. D: IOA complete). In the incomplete folder will also be a word file that will have a description of what both the target child and peer buddy are wearing in the video (so you can code the correct children). Once the Peer Buddy Intervention Fidelity Data Collection form is complete, please return the form to me (there will be a folder labeled IOA on my desk).

Coding
Before coding, please complete the top portion of the form. The Child ID will be provided for you in the word file that also contains a description of the child. Your word file will have the video name, corresponding description of the peer buddy and target child for the video you will be watching, and the child ID for each video you are assigned. The Date is the date you are completing IOA. The Video File is the file name I created and have saved the video under. The Data Collector is you ID. You will also check 'yes' for Reliability session in the top right corner.

There are 3 categories you will be coding for the target child's duration of play:

3. Duration of play
4. Number of children present
5. PB present

3. PLAY (Duration)

Play can be in the form of parallel, associative, or cooperative play (see the definitions of these types of play below). Broad examples include: the peer buddy engaging with the same type of toy as the target child in the same way; the peer buddy playing with a different toy than the target child, but in the same or similar way; the peer buddy and target child engaging with toys within the same play scheme; or the peer buddy is sharing and exchanging toys with the target child. Play CAN NOT be in the form of onlooker or solitary independent play (see definitions below).

Onset:
- As soon as the target child meets the requirements for 'play,' the time indicated on the video file is recorded in the Start time portion of the form.
- The target child can move between the different types of play and the duration would continue, as long as there is not a break in play for longer than 5 seconds.

Offset:

- When the target child no longer meets the requirements for 'play' for longer than 5 seconds, the time indicated on the video file is recorded in the End time portion of the form.

Examples:

- The target child and another child are playing with blocks, building towers next to each other on the carpet.
- The target child is playing with cars, the other child has a block and is pretending it is a car, following/copying the actions of the target child.
- The target child and another child are in the dramatic play center and the target child is 'washing dishes' and another child is 'cooking' in the kitchen in the dramatic play center.
- The target child takes turns with another child playing a game at a table.
- The target child gives or exchanges a play dough tool with another child while sitting at the art table.

Non-examples:

- The target child is building a tower with blocks, while another child is lining up cars (unless it is clear that they are building a garage or road to put cars on).
- The target child is painting, while another child is playing with play dough.
- The target child and other children are playing two different games.
- One child takes/grabs a toy from another child (this could happen within an example of play, but in itself, does not provide an example of play).

IMPORTANT: When the target child is no longer meeting any of the definitions of play described above, move to the next line on the form. Begin recording duration again when the definition for play is again met. DO NOT code the other two categories if the definition for play is not being met.

*At the conclusion of the video, the data collector should calculate the duration of each episode by subtracting the Start time from the End time. The duration should be recorded in minutes and seconds.

Decision Rules

- If a child is in the process of getting materials (i.e., getting blocks from the shelf and bringing them to carpet; getting food from cabinet and bringing it to the table), this would still be considered play. Do not consider this a break from play. There is no need to count 5 seconds and then stop, unless the child begins to do something else and it does not seem like they are looking for materials anymore.
- If the target child or another child walks away and is in the process of coming back when the 5 second count is over, this can still be considered part of the same play episode. Do not code as the same play episode if the target child or other child begins to come back to the area after the 5 second count is over.
- When at the art table, drawing pictures/creating (with play dough, drawing, painting, etc.) is considered play if the children seem to be looking at each other's work and/or creating similar things. Most likely, the children will be using the same material, but this

does not have to be true in all cases (one child is drawing and one is painting, but they are looking at each other's work and making the same thing).

- If the children worked collaboratively to create something and are playing with it (a train track, road for cars out of blocks), do not assume the play requirement is still being met. If the children are playing with the creation, but not meeting the requirements for play, do not code play. For example, a long train track is made, and one child is playing at one end and the other child is playing at the other end. They are not looking at each other or engaging in parallel play. This no longer meets play requirements.
- Cleaning up an area or game is coded as play, as long as both children are cleaning together.
- As long as one of the children does not walk away or begin to play with another toy, a board game continues to be counted as one episode, as long as both children are taking turns.
- For the onset of parallel play, both children need to have the toys/materials in their hands.
- If children are at a table or at a sensory table, stay can only be coded if the children are next to or across width-wise from each other. For example, the children cannot be at opposite ends of the table length-wise.
- If teacher, researcher, or videographer interrupts play to talk to target child or another child (if there are only 2 children present), stop duration code. This can also occur if the target child or peer buddy begin talking to the teacher, researcher or videographer and stop playing. Begin duration again when the teacher and child stop talking and the child begins playing again. If the child is still playing while talking to the adult, this is not considered an interruption and duration code should continue.

Play Definitions (Parten, 1932)

(Non-Example) Onlooker—The child spends most of his time watching the other children play. He often talks to the children whom he is observing, asks questions, or gives suggestions, but does not overtly enter into the play himself. This type differs from the unoccupied in that the onlooker is definitely observing particular groups of children rather than anything that happens to be exciting. The child stands or sits within speaking distance of the group so that he can see and hear everything that takes place.
(Non-Example) Solitary independent play—The child plays alone and independently with toys that are different from those used by the children within speaking distance and makes no effort to get close to other children. He pursues his own activity without reference to what others are doing.
Parallel activity—The child plays independently, but the activity he chooses naturally brings him among other children. He plays with toys that are like those which the children around him are using, but he plays with the toy as he sees fit, and does not try to influence or modify the activity of the children near him. He plays *beside* rather than *with* the other children.
Associative play—The child plays with other children. The conversation concerns the common activity; there is a borrowing and loaning of play material; following one another with trains or wagons; mild attempts to control which children may or may not play in the group. All the members engage in similar if not identical activity. The

children do not subordinate their individual interests to that of the group; instead each child acts as he wishes.

Cooperative or organized supplementary play—The child plays in a group that is organized for the purpose of making some material product, or of striving to attain some competitive goal, or of dramatizing situations of adult and group life, or of playing formal games. There is a marked sense of belonging or of not belonging to the group. The control of the group situation is in the hands of one or two of the members who direct the activity of the others. The goal as well as the method of attaining it necessitates a division of labor, taking of different roles by the various group members and the organization of activity so that the efforts of one child are supplemented by those of another.

4. Number of children the target child is playing with

Once the play definition is met and the start time for duration has been recorded, begin to code the number of children present, besides the target child. The target child should not be included in the number of children present. ONLY THE HIGHEST NUMBER OF CHILDREN PRESENT needs to be recorded. For example, if duration begins with the target child and 1 other child playing, but then during the same duration of play 3 additional children come over and begin playing, record 4 as the number of children present. The highest number of children present should be coded for children who are present AT THE SAME TIME. For example, if 1 child plays and leaves, and then another child plays and leaves, the number of children present should be coded as 1.

5. PB Playing

Once the play definition is met and the start time for duration has been recorded, begin to observe whether the peer buddy is present. If the peer buddy is present at any time during the duration of play, circle yes. If the peer buddy is not present at any time during the duration of play, circle no.

Figure 2. Codes and training manual for target child's duration of play.

Appendix K

Target Child Initiations and Responses

Data Storage Plan
You will be given a video to conduct Interobserver Agreement (IOA) checks. Videos will be on an external hard drive in my office (304E). The external hard drive will have a folder with your ID for videos that need to be watched (ex. D: incomplete IOA) and also a folder that you will move videos to after you have completed IOA (ex. D: IOA complete). In the incomplete folder will also be a word file that will have a description of what both the target child and peer buddy are wearing in the video (so you can code the correct children). Once you are finished coding the video using the tablet, you will move the file onto the external hard drive into your completed IOA folder using a thumb drive (I will provide this).

Files should be saved as follows: your ID_IOA_file name (this will be the name I created for the video; it will have a date)date you completed IOA

Example: D_IOA_TC1PB2_01.12.15_02.15.15

Coding
As you observe a video of the child, you will code the frequency of the target child's initiations and responses. You will code the target child's initiations and responses to peer buddies and initiations and responses to other children in the classroom separately. See definitions and codes below. Coding will be completed using the Dell tablets. Make sure the tablets are fully charged (or are plugged in) before you begin coding. Videos should be 10 minutes (or 600 seconds) in length.

PASSWORD for the tablets is 1122-/

There are four distinct categories of target child behaviors that will be coded:

1. Initiations to Peer Buddy
2. Responses to Peer Buddy
3. Initiations to Other Children
4. Responses to Other Children

1. Initiation to Peer Buddy (Initiation PB): This code should be recorded when the child is observed initiating or attempting to initiate a verbal or nonverbal interaction directed toward a peer buddy.

Initiations to Peer Buddy might include statements that are:

- Validating, such as praise or complimentary statements
- Statements intended to help or assist
- Statements, comments or questions
- Nonverbal child-initiated interactions might include:
    - Validating gestures or physical affection/Appropriate nonverbal initiations

Specific examples:

- "I like your shirt."
- "Good job!"
- "Nice try."
- "You are my best friend!"
- "You get another turn."
- "Try it this way."
- "Let me help you." "You get another turn."
- "Did you know today is my birthday?"
- "Let's play with the cars."
- Thumbs up,
- High fives,
- Hugs,
- Tapping on a peer's shoulder in an effort to get social attention
- Making eye contact with peer, giggling, and shifting gaze to an object or event
- Handing a child a toy or other object

2. Response to Peer Buddy (Response PB): This code should be recorded when the child is observed responding or attempting to respond with a verbal or nonverbal interaction directed toward the peer buddy. Child social responses occur following an interaction initiated by peer and might include statements directed to peer that are considered validating such as praise, complimentary, or acknowledging in nature, statements intended to help, assist, or that are supportive in nature or statements, comments, or questions.

Responses to Peer Buddy might include statements that are:

- Validating such as praise, complimentary or acknowledging statements
- Statements intended to help or assist
- Neutral responses
- **Nonverbal** child social responses to peer-initiated interaction might include:
    - Validating gestures
    - Physical affection

Specific Examples:

- "You did it!" "You're going to win." "Nice try"
- "You are my best friend."
- "You get another turn."
- "Try it this way."
- "Let me help you."
- "Yes, here is the blue crayon."
- "I am almost finished"
- Thumbs up,
- High fives,

- Hugs, Nonverbal responses that are appropriate such as handing a toy or assisting with providing an object (sharing box of crayons by presenting) in response to peer request, accepting a toy

3. Initiation to Other Children (Initiation O): This code should be recorded when the child is observed initiating or attempting to initiate a verbal or nonverbal interaction directed toward other children in the classroom (NOT the peer buddy).

Initiations to Other Children might include statements that are:

- Validating, such as praise or complimentary statements
- Statements intended to help or assist
- Statements, comments or questions.
- Nonverbal child-initiated interactions might include:
    - Validating gestures or physical affection/Appropriate nonverbal initiations

Specific examples:

- "I like your shirt."
- "Good job!"
- "Nice try."
- "You are my best friend!"
- "You get another turn."
- "Try it this way."
- "Let me help you." "You get another turn."
- "Did you know today is my birthday?"
- "Let's play with the cars."
- Thumbs up,
- High fives,
- Hugs,
- Tapping on a peer's shoulder in an effort to get social attention
- Making eye contact with peer, giggling, and shifting gaze to an object or event
- Handing a child a toy or other object

4. Response to Other Children (Response O): This code should be recorded when the child is observed responding or attempting to respond with a verbal or nonverbal interaction directed toward other children in the classroom (NOT peer buddy). Child social responses occur following an interaction initiated by peer and might include statements directed to peer that are considered validating such as praise, complimentary, or acknowledging in nature, statements intended to help, assist, or that are supportive in nature or statements, comments, or questions.

Responses to Other Children might include statements that are:

- Validating such as praise, complimentary or acknowledging statements
- Statements intended to help or assist
- Neutral responses

- **Nonverbal** child social responses to peer-initiated interaction might include:
    - Validating gestures
    - Physical affection

Specific Examples:

- "You did it!" "You're going to win." "Nice try"
- "You are my best friend."
- "You get another turn."
- "Try it this way."
- "Let me help you."
- "Yes, here is the blue crayon."
- "I am almost finished"
- Thumbs up,
- High fives,
- Hugs, Nonverbal responses that are appropriate such as handing a toy or assisting with providing an object (sharing box of crayons by presenting) in response to peer requests, accepting a toy

Decision Rules

- In sustained interactions between the TC and a peer, each social behavior by the TC should be coded.

    - Only the TC's first attempt at initiating a conversation is coded as initiation; all comments by the TC that follow after this initiation are coded as a response, even if the TC seems to initiate a topic change.

    - However, if there is at least a 3 second pause between comments (i.e.,, a 3 second break in the conversation) and then the TC makes a comment, this is coded as an initiation, even if the TC's comment is related to what was last said by the conversational partner.

- Compliance with teacher prompts, directions, or hand-over-hand assistance to initiate or respond using verbal language, PECS, sign language, or other communication system counts as a social interactive behavior (initiation or response). When this is observed, code following the guidelines below, but also code **PROMPTED** on the tablet.

    - If a teacher prompts the child to use a sign or PECS visual, the teacher is assisting the child with an initiation. This is coded as an initiation. Press the relevant initiation button, followed by the prompt button.

    - If a teacher assists a target child in initiating to a peer, that is coded as an initiation toward another peer. Press the relevant initiation button, followed by the prompt button.

- If a teacher assists a target child in responding to a peer, that is coded as a response toward another peer. Press the relevant response button, followed by the prompt button.

- If the target child is interrupted by a teacher providing a prompt in the middle of a response, continue to code based on the target child's behavior.
    - For example, if a target child begins to respond and the teacher provides a prompt and the child continues to respond, this would still be considered the SAME RESPONSE because there has not been a 3 second pause and the other child has not said anything. Code PROMPT when the teacher provides a prompt, but DO NOT code another response or initiation. However, if the other child says something and then the target child responds (prompted or not), this would be a new response. Code each teacher prompt.
    - In essence, the target child has made one long response (interrupted by the teacher). New responses are only coded if the other child says something for the target child to respond to.

- If the target child initiates or responds to both the peer buddy and another child at the same time (ex. Hey guys!), code this as being towards both peer buddy and other children. Push both buttons as close together as possible.
    - If the child initiates or responds to another child at the same time as initiating or responding to another child, code both. For example, a child says, "It's his turn," to the peer buddy and hands the toy to another child.

- If a child is talking to the teacher or a different child, this breaks the conversation (if more than 3 seconds occur before the child again initiates and responds). If more than 3 seconds occur before the child again talks to the other child, code as a new initiation. If 3 seconds do not occur, continue coding responses (if applicable).

- If a child takes an item from the target child's vicinity or does something to the target child that is non-social in nature (i.e., bumps into them) and the target child then says something to the child, this should be coded as an initiation by the target child. So, for example, if a child comes over and takes a toy from in front of the target child without saying anything to the target child, and the target child says 'hey! That's mine' or makes some kind of sound in response (or tries to take the toy back) initiation should be coded.
    - A non-example of this would be if the target child is holding an object or toy and another child takes it out of the target child's hand. The target child trying to take the toy back or saying something would be coded as a response.

- Noises made by either child are only coded if the noises are reciprocal in nature.

Decision Rules for Coding from Video

- If it is unclear whether a child is talking to him/herself, look at the child's gaze. If the child does not look at the other child, do not code.
    - However, code if the child is not looking, but responds with an appropriate/same topic response. Also code if the child is not looking at another child, but initiates by saying the child's name.

- If only the back of the child's head is seen, do not code (it is not possible to tell who the child is talking to or if they are definitively talking).
    - However, code if there are **only two children in the area** (the target child and one other child) and it is not possible to see the child's mouth, but it is possible to hear the child.
    - if you can only see the back of the other child's head (and so cannot tell if talking is occurring), code the target child's behavior as an initiation.

- If the child's mouth is moving and he/she is looking at another child or, code as an initiation or response, whether or not it is possible to hear what the child is saying.

Figure 1. Codes and training manual for target child initiations and responses.

Appendix L

Class-Wide Social Engagement

Teacher ID: _____ Date: _____

Rater: _____ Total adults in class: _____

Total children in class at start: _____ Total children in class at end: _____

Interval	# of children **not** socially engaged	# of children socially engaged	Notes	Interval	# of children **not** socially engaged	# of children socially engaged	Notes	Interval	# of children **not** socially engaged	# of children socially engaged	Notes
1				**21**				**41**			
2				**22**				**42**			
3				**23**				**43**			
4				**24**				**44**			
5				**25**				**45**			
6				**26**				**46**			
7				**27**				**47**			
8				**28**				**48**			
9				**29**				**49**			
10				**30**				**50**			
11				**31**				**51**			
12				**32**				**52**			
13				**33**				**53**			
14				**34**				**54**			
15				**35**				**55**			
16				**36**				**56**			
17				**37**				**57**			
18				**38**				**58**			
19				**39**				**59**			
20				**40**				**60**			

Directions:
Write the teacher ID, date of observation, data collector ID, total number of adults in the class, and total number of children present in the classroom before the start of the observation.

- Observe classroom for 15 minutes
    - Observe (scan the classroom) for 10 seconds
    - Record for 5 seconds

Record:

1. The number of children who met the definition of NOT being socially engaged during the 10 second scan of the classroom
2. The number of children who met the definition for being socially engaged during the 10 second scan of the classroom
3. Important notes (e.g. -1C for a child who left the room or is working one-on-one with an adult, +1C for a child who enters the room, etc.)

At the conclusion of the observation, record the number of children present in the classroom.
Social engagement: Children are socially engaged if they are proximal/oriented towards a peer or peers and engaged with the same or similar materials or using materials in the same way as the peer(s). Adults are not included in the measure of social engagement. If a child is receiving one-on-one instruction from an adult, do not consider that child while observing.
Decision Rules:

- If children are on their own computer or tablet, they are NOT socially engaged (even if they are talking periodically). If shared computer or tablet, children can be counted as being socially engaged, as long as children are playing a game (i.e. NOT watching a show/movie).
- Pause when a teacher direction is given class-wide (i.e. transition warning, move between centers, etc.)
- If children are at a table or at a sensory table, stay can only be coded if the children are next to or across width-wise from each other. For example, the children cannot be at opposite ends of the table length-wise.
- If teacher gives direction and is with the child, the child is counted as -1, but if a direction is given and the child follows direction independently, child is still counted.

Figure 1. Data collection form and directions for the class-wide social engagement measure.

Appendix M

Sociometric Rating Activity

Very Happy Face	Happy Face	Neutral Face
		

Figure 1. Visuals for sociometric rating activity.

Sociometric Rating Activity

Classroom ID: _____ Date: _____

Child ID: _____ Data collector: _____

Instructions: Have children sort food into boxes. Explain that the really happy face means you 'eat it all the time', the happy face means you 'eat it sometimes', and the neutral face means you 'don't eat it very much.'

Once children demonstrate an understanding of sorting, explain that we are going to sort our friends into boxes. Explain that the really happy face means you 'play all the time', the happy face means you 'play sometimes', and the neutral face means you 'don't play very much' with each child.

After the child has sorted all classmates, write the child Is below.

All the time	Sometimes	Not very much

Figure 2. Sociometric rating activity recording form.

Appendix N

Social Validity Questionnaires

Directions: Please mark an X in the column that best reflects your answer to each question.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. The intervention has been effective in increasing _____'s [target child] social interactions with the peer buddies.					
2. The intervention has been effective in increasing _____'s [target child] social interactions with other peers in the classroom who did not participate in the study.					
3. I have noticed _____ [peer buddy] using the Stay-Play-Talk strategies he/she was taught with the target child across the day.					
4. I have noticed _____ [peer buddy] using the Stay-Play-Talk strategies he/she was taught with other children besides the target child.					
5. I have noticed _____ [peer buddy] using the Stay-Play-Talk strategies he/she was taught with the target child across the day.					
6. I have noticed _____ [peer buddy] using the Stay-Play-Talk strategies he/she was taught with other children besides the target child.					
7. The peer-implemented intervention Stay-Play-Talk is feasible and appropriate for increasing the social interactions of children.					

Figure 1. Social validity questionnaire for teachers.

Date: _____

Directions: Please mark an X in the column that best reflects your answer to each question.

Target Child 1

	Poor	Fair	Average	Above average	Excellent
Clip 1: Rate the target child's social engagement with peers.					
Clip 2: Rate the target child's social engagement with peers.					
Clip 3: Rate the target child's social engagement with peers.					
Clip 4: Rate the target child's social engagement with peers.					

Figure 2. Social validity questionnaire for pre-service teachers.

Appendix O

Teacher Information

Teacher ID: _____ Date: _____

1. What is your gender?

☐ Female
☐ Male

2. How old are you?

3. What is your race/ethnicity? (check all that apply)

☐ Black / African American
☐ Hispanic / Latino
☐ White, not Hispanic
☐ Asian
☐ Native Hawaiian / Pacific Islander
☐ American Indian / Alaskan Native

4. How many years of experience working with young children do you have?

5. What is your current position?

6. How long have you been working in your current position?

7. Do you have any teaching certifications?

☐ No

☐ Yes Certifications: _____

Figure 1. Teacher demographic questionnaire.

Child Information

Child ID: _____ Date: _____

Respondent's name: _____

Relationship to child: _____

1. What is the child's birth date?

   _____

2. What is the child's gender?

   ☐ Female
   ☐ Male

3. What is the child's race/ethnicity (check all that apply)?

   ☐ Black / African American
   ☐ Hispanic / Latino
   ☐ White, not Hispanic
   ☐ Asian
   ☐ Native Hawaiian / Pacific Islander
   ☐ American Indian / Alaskan Native

4. Does the child have an identified disability/special education eligibility? If yes, please indicate the child's disability/eligibility category.

   ☐ No

   ☐ Yes Disability: _____

Figure 2. Child demographic questionnaire.

Appendix P

Play Behavior Observation

Play Behaviors F = Functional Play with Pretense, O = Object Substitution, I = Imagining Absent Objects, A= Assigning Absent Attributes Underline all different play behaviors; V = Vocalization; Vertical lines indicate sequence breaks; Stacked letters indicate behavior falling into 2 or more categories			
Date:	Child ID:	Start time:	End time:

Appendix Q

System-of-Least Prompts Procedure Protocol

STAY
If peer buddy is not in the same center as the target child:

- Wait 12-20 seconds
- Provide prompt 1 (gestural): show small visual of STAY
- Wait 5 seconds
- Provide prompt 2 (verbal): show small visual of STAY and provide verbal prompt (example: "Make sure you are staying close to you friend.")
- Wait 5 seconds
- Provide prompt 3 (physical): give controlling prompt
    - Verbal prompt (example: "I'm going to help you stay close to your friend") while leading child to the same center as target child)

PLAY
If peer buddy is not meeting the definitions for play:

- Wait 12-20 seconds
- Provide prompt 1 (gestural): show small visual of PLAY
- Wait 5 seconds
- Provide prompt 2 (verbal): show small visual of PLAY and provide verbal prompt (example: "Make sure you are playing with your friend.")
- Wait 5 seconds
- Provide prompt 3 (physical): give controlling prompt
    - Verbal prompt (example: "Let's play with our friend") while providing hand-over-hand assistance for child to play with target child (examples: hand a toy, add to a game or building, etc.)

*Repeat as needed when play stops

TALK
If peer buddy does not talk to target child:

- Wait 12-20 seconds
- Provide prompt 1 (gestural): show small visual of TALK
- Wait 5 seconds
- Provide prompt 2 (verbal): show small visual of TALK and provide verbal prompt (example: "Remember to talk to your friend.")
- Wait 5 seconds
- Provide prompt 3 (model): give controlling prompt
    - Provide verbal model (examples: "Say, I like your toy!" "Say, Do you want to play with me?" "Say, Can I build with you?" etc.)

*Repeat as needed when talk has not been met 2 times within stay-play-talk episode

Appendix R

Procedural Fidelity Forms

Whole Class SPT Training Procedural Fidelity Checklist

Child ID's: _____

_____ Trainer: _____

Date: _____ Data collector: _____

Start time: _____ End time: _____

Activity	Observed	
	Yes	No
1. At the beginning of the training, trainer reminds children of the importance of the skills being taught.		
2. Trainer reviews previously taught skills verbally and through visual reminder. (If applicable, write n/a if this is the first training session).		
3. Trainer introduced the new skill using a visual.		
4. Trainer has children repeat the skill aloud.		
5. Trainer describes what it means to perform the skill.		
6. Trainer gives examples of how to perform the skill.		
7. Trainer models the skill with another adult.		
8. Trainer has children practice the skill in small groups, with feedback as needed.		
9. Trainer brings children back to large group and reviews the skills, referring to the visual.		
10. Trainer reminds children they should be buddies all the time, and also introduces children to buddy time.		

Figure 1. Whole class SPT training procedural fidelity checklist.

Triad SPT Training Procedural Fidelity Checklist

Child ID's: _____ _____ Trainer: _____

Date: _____ Data collector: _____

Start time: _____ End time: _____

Activity	Observed	
	Yes	No
1. At the beginning of the training, trainer reminds children of the importance of the skills being taught.		
2. Trainer reviews previously taught skills verbally and through visual reminder. (If applicable, write n/a if this is the first training session).		
3. Trainer reviews the new skill using a visual.		
4. Trainer reviews what it means to perform the skill.		
5. Trainer gives examples of how to perform the skill with the target child.		
6. Trainer has each peer buddy practice the skill with the trainer.		
7. Trainer has each peer buddy practice the skill with the target child, with feedback provided as needed.		
8. At the conclusion of training, trainer reviews the skill, referring to the visual.		
9. Trainer reminds children they should be buddies all the time, and also reminds the children about buddy time.		

Figure 2. Triad SPT training procedural fidelity checklist.

Whole Class Booster SPT Training Procedural Fidelity Checklist

Child ID's: _____ _____ Trainer: _____

Date: _____ Data collector: _____

Start time: _____ End time: _____

Activity	Observed	
	Yes	No
1. At the beginning of the training, trainer reminds children of the importance of the skills being taught.		
2. Trainer reviews STAY visual and definition.		
3. Trainer reviews PLAY visual and definitions.		
4. Trainer reviews TALK visual and definition.		
5. Trainer and teacher model STAY, PLAY, and TALK for the class.		
6. At the conclusion of the training, trainer reviews all 3 skills, referring to the visual.		

Figure 3. Whole class booster SPT training procedural fidelity checklist.

Stay-Play-Talk Training Procedural Fidelity Checklist: BOOSTER

Child ID's: _____ _____ Trainer: _____

Date: _____ Data collector: _____

Start time: _____ End time: _____

Activity	Observed	
	Yes	No
1. At the beginning of the training, trainer reminds children of the importance of the skills being taught.		
2. Trainer reviews STAY visual and definition.		
3. Trainer reviews PLAY visual and definitions.		
4. Trainer reviews TALK visual and definition.		
5. Trainer has each peer buddy practice the skills with the target child, with feedback provided as needed.		
6. At the conclusion of training, trainer reviews all 3 skills, referring to the visual.		
7. Trainer reminds children they should be buddies all the time, and also reminds the children about buddy time.		

Figure 4. Triad booster SPT training procedural fidelity checklist.

Implementation Fidelity

Child ID: _____ Video File: _____

Date: _____ Data collector: _____

Instructions: Mark + if behavior occurred, 0 if it did not, and — if behavior was not applicable

Prior to observation, researcher provided verbal prompt that today is buddy day, explained the checklist, and reviewed each strategy	
Researcher started the visual timer.	
Reviewed child checklist with peer buddy following observation	
Provided reinforcement and/or reminders for strategy use following observation	
Total Present:	/

☐ Prior to observation, the teacher made a general announcement to the class that it was 'buddy time.'

STAY						PLAY						TALK						
Waited 12-20 sec	Provided prompt 1	Waited 5 sec	Provided prompt 2	Waited 5 sec	Provided prompt 3	Waited 12-20 sec	Provided prompt 1	Waited 5 sec	Provided prompt 2	Waited 5 sec	Provided prompt 3	Waited 12-20 sec	Provided prompt 1	Waited 5 sec	Provided prompt 2	Waited 5 sec	Provided prompt 3	Mark 1 if trial correct
																	Total correct:	/

Total % correct for researcher:

Correct = _____ Total = _____ % correct = _____

Tally of number of prompts provided by the teacher (or write N/A): _____

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