USING STAY-PLAY-TALK TO INCREASE LEVELS OF INITIATIONS AND RESPONSES FOR CHILDREN WITH SOCIAL DELAYS

by

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Children with social delays may engage in lower rates of reciprocal peer interactions that can affect social communication development due to the lack of opportunity, deficits in play skills and joint attention. Researchers have identified Stay-Play Talk (SPT) as an effective peer-mediated strategy to increase socially significant changes and improvements in social interactions. However, there are gaps in the current research pertaining to increasing target child initiations, generalization and maintenance of behaviors, and as well as social validity. Building upon previous research, we implemented a class-wide stay-play-talk intervention with a behavior skills training component and system-of-least prompts procedure in an inclusive, university-based preschool consisting of two target children with social delays and nine peer participants. We used a multiple baseline design to measure target children's frequency of stay, play and talk behaviors, as well as frequency of initiations, responses and narrative play statements. Findings show that despite the covariation between tiers, limited data points and limited confidence in the presence of a functional relation, levels of stay, play and talk for both participants were consistently higher during intervention sessions than during initial baseline sessions. Target children's levels of verbal initiations also displayed an increasing trend throughout the intervention. Finally, "buddy time" or the class wide SPT intervention was seen as socially valid amongst most children.

INTRODUCTION

Forming social relationships is an integral part of life. From birth, social interactions can shape an individual's learning experience, engagement, participation (Lerner & Ciervo, 2004) and social competence (Martinez et al., 2021). Positive social and play skills are highly emphasized in inclusive early childhood classrooms to create a more purposeful and inclusive learning experience for all children (Severini et al., 2019). Such skills are directly related to academic readiness, communicative acts, and social-emotional competence which affect later developmental trajectories (Hemmeter et al., 2013).

Children with social delays may engage in lower rates of reciprocal peer interactions due to lack of opportunity or deficits in play skills and joint attention (Barber et al., 2016). While inclusive early childhood settings provide an avenue for social interactions, children with high levels of social interaction usually interact with one another rather than with children with lower social competence (Goldstein & English, 1997; Thomson, 2012). As a result, students with social delays become socially isolated from engaging in meaningful connections and interactions if they are not provided with adequate, structured opportunities (Goldstein & English, 1997).

Adult support and mediation in inclusive classrooms are essential for helping children with social delays to make bids with peers and sustain relationships. Particularly, adult supports targeting typically developing peers are needed to address social isolation of learners with disabilities by teaching their socially connected peers how to interact (Severini et al., 2019). Thus, the use of peer-mediated interventions (PMI) is important in

inclusive classrooms to increase the amount of peer interaction between typically developing peers and target children with social delays (Odom & Strain, 1984).

Stay-Play-Talk (SPT) is a peer-mediated intervention designed to increase rates of social interaction in inclusive preschool classrooms by teaching peers specific strategies on how to stay within proximity, establish mutual attention through play, and talk with their peers with disabilities (Goldstein et.al., 1992; English et al., 1997). SPT uses reinforcement, prompting, and behavioral skills training to establish and sustain targeted behaviors during child-directed free play activities (Ledford et al., 2016). Variations of SPT interventions result in increase in the number, length, reciprocity, and rate of social interactions between typically developing children and children with disabilities (Goldstein et.al, 1992; Kohler et al., 2007; Hughett et al., 2013). Thus far, studies have been primarily conducted in early childhood classrooms with children diagnosed with autism spectrum disorder (ASD; Barber et al., 2015; Kohler et al., 2007; Osbourne et al., 2019) and other developmental disabilities (Hughett et al., 2013; Goldstein et al., 1997; Milam et al., 2017) and focused on targeting requests (Goldstein et al., 1997), initiations and responses (Goldstein et al., 1997; Kohler et al., 2007; Barber et al., 2016) and social play (Severini et al., 2019, Hughett et al., 2013, Maich et al., 2018, Osbourne et al., 2019).

SPT interventions include training sessions with teaching, modeling and practicing specific strategies on how to stay, play and talk amongst peers (Ledford et al., 2016). Previous SPT studies have mainly conducted small-group training sessions wherein the implementer teaches typically developing peers on SPT strategies in an isolated setting (Barber et al., 2015; Osbourne et al., 2019). Meanwhile, several studies

have conducted small group training sessions including the target children to increase peer use of specific strategies, fluency and consistency with their assigned target child (Milam et al., 2017; Kohler et al., 2007; Hughett et al., 2013). However, there is limited data on generalization and maintenance of SPT strategy use amongst peers and target participants (Milam et al., 2018). To address the gap, Milam and colleagues (2018) included class-wide training sessions to increase maintenance and generalization of SPT behaviors amongst peers and target children. Class-wide interventions are known to be effective in promoting behavior management strategies (Barrish et al., 1969; Morrison & Jones, 2007; Moore et al., 1994) and social skills (Durlak et al., 2011; Webster et al., 2008) through repeated exposure of contingencies, multiple exemplar training and practice. According to Greenwood and colleagues, class-wide interventions are used for the practical advantages in terms of efficiency and vicarious learning (1992). It can increase overall engagement, as well as generalization and maintenance of social behaviors (Thomson, 2012; Hanley et al., 2007). When peer-mediated social skills are taught and practiced in a whole group setting, findings show generalized use of strategies to similar activities and increased levels of play engagement (Milam et al., 2018). Even so, there is still limited information on SPT strategies being used in different classroom contexts (e.g., outdoor play, group instruction time, other center activities) and how SPT behaviors maintain for target participants after intervention implementation (Goldstein et al., 1997; Hughett et al., 2013; Kohler et al., 2007; Severini et al., 2019).

While SPT has generally been effective for increasing social interactions amongst and target children with ASD and/or other developmental disorders in classroom settings, there are still gaps in the research that can be addressed. There is a limited amount of SPT

research focused on levels of initiations by the focal participant. According to a systematic review and meta-analysis of SPT interventions conducted by Ledford and Pustejovsky (2021), visual-analysis reports show a larger proportion of behavior change for peer implementers than the focal participant. Such findings raise questions about the effectiveness of SPT interventions in creating balanced opportunities for the target population to initiate and respond to their typically developing peers.

Interventions focused on increasing target child initiations project better long-term outcomes (Martinez et al., 2021; Koegel et al., 2003) regarding social independence and participation across settings in general education (Garrison-Harrell et al., 1997). There has yet to be a demonstrated correlation between teaching peers explicitly how to engage in the presence of the target child and increased levels of SPT behaviors during behavior skills training (BST) sessions (Osbourne et al., 2016). Therefore, it would be helpful to know if including target participants in the training sessions is a meaningful adaptation to typical SPT protocol procedures (Kohler et al., 2007; Severini et al., 2019).

Moreover, there is limited research on children with social delays or low levels of peer-interaction (Smith et al., 2009; Milam et al., 2021), as current SPT studies mainly focus on learners with ASD or other developmental delays (Severini et al., 2019; Maich et al., 2018; Osbourne et al., 2016; Barber et al., 2016; Goldstein et al., 2007; Kohler et al., 2007). Exploring the effects of SPT interventions for learners with social delays may produce socially significant changes in social engagement and social pivotal behaviors (e.g., self-initiation and responsivity to multiple cues) which can lead to improved long-term trajectories (Koegel, 1988; Koegel et al., 2003; Milam et al., 2021).

Current SPT studies also show a lack of generalization and maintenance of skills across settings and contexts for peers and target participants (Goldstein et al., 1997; Hughett et al., 2013; Kohler et al., 2007; Severini et al., 2019; Milam et al, 2018; Milam et al., 2021). Results reported by Milam and colleagues (2021) show the promise of SPT for producing socially significant changes in the social engagement of target children in the absence of peer buddies during the generalization probes. Such findings support the importance of measuring maintenance and generalization outcomes.

A limited number of reports have been made on the social validity of SPT interventions for teachers, and even fewer for target participants (Milam et al., 2021; Severini et al., 2019; Goldstein et al., 1997) which gives an incomplete portrayal of the social significance and feasibility of implementing SPT procedures for classrooms (Martinez et al., 2021). It would be helpful to know if participants and peers prefer typical classroom free play procedures than SPT, since peer expectancy and motivation may be directly related to intervention success (DiSalvo & Oswald, 2002).

While SPT research has been linked to socially significant changes and improvements in social interactions in target children (Milam et al., 2021; Ledford & Pustejovsky, 2021), gaps in rate of target child initiations, generalization, and maintenance of skills, as well as social validity amongst participants remain prevalent. The purpose of this study is to extend current research on SPT interventions by including participants with low levels of peer interaction or social delays. A total of 9 peer buddies and 2 target participants joined the study. Behavior skills training sessions for the targeted SPT behavior (stay, play, talk) were conducted after previous behavior has remained stable for three consecutive sessions to increase maintenance of behaviors. The

study was conducted as a class-wide intervention to increase generalization of behaviors to different classroom contexts. The SPT intervention was conducted with a system-of-least prompts prompting procedure if participants were not implementing SPT strategies with their partners during the 10-minute intervention. Target child frequency of stay and play behaviors, as well as frequency of initiations, responses and narrative play statements were examined using a multiple-baseline design. The following research questions will be examined: Does Stay-Play-Talk with a behavioral skills training component increase target children's levels of interaction during intervention? Do target children's increased levels of interactions maintain after removal? Do students prefer Stay-Play-Talk with a behavioral skills training component rather than typical classroom free play procedures? Finally, what are the impacts of SPT on initiations, responses and play narration?

METHODS

Participants

After obtaining IRB approval and parental consent, the researcher recruited two children who demonstrated low levels of peer interaction or were at-risk for social delays to participate in the study. Inclusion criteria and measurement information are shown in Table 1 for focal participants and Table 2 for implementing peers. One child in the classroom met inclusion criteria for being a focal participant. Although the second child did not meet all criteria (see below), teachers reported they believed he would benefit from the intervention because he interacted well but with a relatively small number of peers. Following baseline data collection, the decision was made to have Louie serve as the primary focal participant of interest, because Miles had frequent prolonged absences.

Miles, a 5-year-old Black male, met the inclusion criteria depicted in Table 1. His teacher reported that he rarely interacted with peers and engaged with toys in solitary and repetitive play. He was diagnosed with autism spectrum disorder (ASD) and used gestures and an Augmentative and Alternative Communication device to communicate when prompted. He received physical therapy (PT), occupational therapy (OT) and speech therapy (ST) during the school day.

Louie was a 4-year-old White male who was diagnosed with ASD. He received PT, OT and ST in school. According to the teacher's report found in Appendix A

(adapted from Severini, 2019), he attempted to interact often with a few peers. However, he infrequently appropriately responded and initiated to peers' play and communication attempts. He communicated using verbal communication and often played alone, in part due to exclusion by his peers (e.g., observers recorded instances where children said things such as "You can't play with us"). Despite his teachers rating his frequency of peer interactions as often, they thought Louie would benefit from the intervention.

The implementer used the teacher report for participants (adapted from Severini, 2019) and the Individual Degree Centrality (IDC) chart for peer participants found in Appendix B to gather information about levels of interaction with the target participants. The implementer conducted probe sessions for eligibility to measure target child's pre-requisite skills of attending and engaging. The social behaviors measured were (a) listener response behavior to name, (b) attending to peer and/or toy, and (c) accepting reinforcement or toy when given by the peer within a total of four trials. After the screening sessions, both target participants were eligible for the study. Target participants demographic information is displayed in Table 3.

Since the study was conducted as a class-wide intervention, the researcher recruited the remaining nine students in the classroom to participate in the study as implementing peers, including 6 girls and 3 boys. Peers included 2 children with disabilities and 7 children without identified disabilities. Demographic data are displayed in Table 4.

Implementers

The implementer was a southeast Asian female graduate student working toward their special education degree and certification in behavior analysis, supervised by a non-Hispanic White female doctoral-level BCBA with experience implementing stay-play-talk and a non-Hispanic White woman who was a doctoral student and BCBA. The implementer was a part-time assistant teacher in the classroom. The secondary coders were a south Asian female and a non-Hispanic White female[Je1], both working toward a special education degree and certification in behavior analysis. The teacher and assistant teacher in the participating classroom participated in SPT implementation with non-participating children. The teacher was a non-Hispanic White woman who is Nationally Board Certified in Special Education and had 12 years as a teacher, including 3 years at the current program. The co-teacher was a Hispanic woman with 15 years of experience in the current program.

Settings and Materials

All sessions were conducted in a university-based inclusive early childhood program in southeastern United States. The classrooms were approximately 8 x 9 m and included six centers in which children were allowed to play during free-play center time (e.g., dramatic play, exploration science, blocks, writing station, art, books, puzzles/games). Typical classroom toys were present (e.g., plastic kitchen food, blocks, cards, puzzles, art supplies) as well as classroom furniture (e.g., child-sized tables and chairs, low-level toy shelves and bean bags). The implementer conducted all sessions in the classroom during regular activities such as large group instruction and free-play. SPT

training and intervention sessions were considered as part of the classroom routine and conducted as a whole class activity. Probe sessions occurred in the classroom (e.g., book nook or construction zone) with one target participant and one peer during free play while all other classroom activities are on-going. Baseline sessions occurred during typical classroom free play period in the various centers. Intervention and maintenance sessions occurred in the classroom during the designated "buddy-time" schedule in the classroom. Children were allowed to move around the room freely and had access to all available classroom centers.

Throughout experimental sessions, participants were free to play with any toys available in any center inside the classroom (e.g., puzzles, cars, blocks, art materials, books). The intervention materials included a Stay-Play-Talk buddy guidebook (See Appendix C, token board and tokens (See Appendix D), as well as a letter-sized laminated poster with the instructions for SPT to be posted in the free play area. Two choices of reinforcers were used each week during intervention conditions (e.g., slap wrist bands, erasers, stamps). All sessions were recorded using a Canon HD mini video camera mounted on a tripod and a wireless condenser microphone. The implementer used a visual stopwatch mounted on a classroom shelf and a stopwatch on the iPhone 12 to keep time and the reinforcement schedule across all sessions. Once the session concluded, videos were uploaded on the Box cloud storage system, coded using *ProcoderDV*™ and graphed using Microsoft ® Excel. Data collectors used *ProcoderDV*™ to gather all data for baseline, intervention and maintenance sessions (see Appendix E). Probe and SPT training session materials included the probe data collection sheet in Appendix F (adapted from Severini, 2019), laminated visual cue cards (7 x 4 cm) of SPT illustrations (see Appendix G), SPT

teaching protocols (see Appendix H), and items that were previously established by the teacher as preferred (e.g., two to three toys and two choices of reinforcement). Participants were provided with a sticker after training sessions for participating.

Response Definitions and Measurement Systems

The primary dependent variables were participants' level of proximity to peers (stay), play with peers (play) and interactions with peers (talk). Secondary dependent variables are the target children's levels of interaction categorized as initiations, responses and narrative play. See Table 5 for Operational Definitions for stay, play and talk behaviors.

Data collectors used *ProcoderDV*™ to code video recordings of stay and play behaviors using fixed interval momentary time-sampling (Ayres & Ledford, 2014) and frequency count-based measurement for talk behaviors. For stay and play behaviors, intervals were 10 s in duration for a total of 60 intervals for each 10-min session. At the end of each interval, the observer recorded whether the target child was demonstrating stay (S), stay and play (SP), no behaviors (None) or not codable (NC; Severini et al., 2019). Talk behaviors were measured using timed event recording and included verbal and non-verbal communicative behaviors. After coding, talk behaviors were categorized using consensus coding to identify whether they were initiations (I), responses (R) or play narrations (NP; i.e., talking about play without explicit direction to a peer; e.g., "I made a rocket!"). See Table 6 for definitions.

Stay and Play behaviors were dyadic in nature—that is, Miles and Louie were judged as staying and playing with their assigned buddy if they were in proximity to and

engaging in play with their buddy, requiring that the buddies were also staying and playing. Because talk behaviors were not necessarily dyadic (i.e., Louie might have talked with a peer who did not respond), focal child and buddy talk was measured separately. Because peer fidelity is captured in the dyadic Stay and Play behaviors and via counts of Talk per session, separate fidelity measures were not recorded for peer behaviors.[Je2]

Given that Miles did not frequently engage in appropriate communicative interactions, and because instruction on functional AAC use was occurring throughout the day, we decided that Talk behaviors would not be assessed for Miles. That is, we decided to continue to prompt and reinforce communication throughout all conditions because holding him in a "baseline" where these behaviors were not prompted or reinforced would not have been ethically viable.

Interobserver Agreement

Interobserver agreement (IOA) data for stay, play and talk behaviors were coded via video recording for a minimum of 30.55% of sessions distributed across participants and conditions. For Louie, the main participant of the study, IOA data for SPT behaviors were coded for 47.82% of sessions across conditions. Sessions were randomly selected using an online random number generator. The researcher trained the secondary coders by reviewing operational definitions, examples and non-examples, and explaining the data collection system. The secondary coders were provided with a coding manual that included onset and offset descriptions of stay, play and talk, examples, non-examples and decision rules for specific classroom scenarios adapted from Milam and colleagues

(2021; e.g., behaviors during clean up, making art, preparing materials; see Appendix I). The researcher and coders practiced coding two pilot videos together and reviewing discrepancies. Following this meeting, the coders were given three 10-min non-study videos to practice coding independently. Coders were required to reach 90% agreement for stay and play variables and 80% agreement for talk across two videos prior to study initiation.

IOA was calculated using point-by-point method by dividing number of agreements by the number of agreements plus disagreements and multiplying by 100 ([agreements] / [agreements + disagreements] * 100; Gast et al., 2018). An agreement was recorded if both observers record the occurrence or non-occurrence of each code (e.g., if the primary researcher recorded "S - stay" for one interval, and the second observer recorded "SP- stay and play", there would be an agreement for stay and a disagreement for play. For count-based variables, an agreement was recorded for the number of utterances of initiations and responses if both coders recorded the occurrence within 5-s of each other (e.g., if the primary coder records two interactions, and second observer records one interaction within 5 s but not two, there would be one agreement and one disagreement). For Stay and Play behaviors, if IOA fell below 90% for two sessions, the primary coder retrained secondary coders by reviewing discrepancies and operational definitions, doing a consensus code together using a non-study video and discussing disagreements. For Talk behaviors, if IOA fell below 80% for two sessions with a minimum of 10 codable talk interactions (e.g., if only 4 behaviors were coded and there was a disagreement for one behavior, the IOA would be 75%), retraining for coders,

reviewing discrepancies and operational definitions occurred. IOA data are displayed in Table 7.

Experimental Design

The researcher used a concurrent multiple baseline across behaviors (e.g., stay, play, talk, behaviors) replicated across two target children to examine the effects of SPT intervention on the level of target children's initiation and responses. The study was designed to meet the following quality indicators as described by Gast and colleagues (2018). Multiple baseline design is appropriate to assess treatments designed to answer demonstration research questions and improve desirable behaviors that are difficult to establish and inappropriate to reverse (Ledford et al., 2017). Given the nature of the dependent variables (e.g., social behaviors), they need to be measured concurrently and continuously since these free-operant behaviors tend to be more variable. The time-lagged introduction of the intervention also controls common internal validity threats of multiple baseline across behavior designs such as attrition, instrumentation and behavioral covariation (Gast et al., 2018).

Data was collected, graphed and visually analyzed to evaluate the presence of a functional relation, individual data patterns and to make on-going experimental decisions (Gast et al., 2018). The researcher analyzed data within and across tiers for level, trend, variability, overlap between data points across conditions, consistency of data within and across tiers, and immediacy of change with the introduction of the intervention (Barton et al., 2018). The research analyzed data of 2-intra-participant replications across three behavior tiers (stay, play and talk). Vertical analysis across tiers of behaviors was used to

establish a functional relation between intervention and behavior change. Experimental control was established when introduction of intervention in one tier results to a behavior change in level, but not produce change in the other tiers.

Procedures

Selecting Buddies

Each day for the duration of the study, children were assigned in pairs to be "buddies" using pseudo-random assignment (e.g., picking out of a hat), with two caveats. First, assigned peers were rotated across experimental sessions such that no peer was assigned with a target participant more than once per week. Second, the researcher took note of peer interactions for further randomized assignments (e.g., if a peer engaged in dissent or challenging behaviors in two consecutive sessions when paired with the target participant, they were no longer eligible to be assigned as his peer).

Screening and Probe Sessions

Prior to conducting the first baseline session, the researcher selected two target children and two randomly selected peer participants. To ensure target children met the inclusion criteria, the researcher conducted screening sessions using the probe data collection sheet (See Appendix F). The 5-min probe sessions occurred in the classroom during free play period for Participant Louie. Miles's probe sessions occurred in the classroom and in outdoor water-play. There was a total of four trials using tangible reinforcers (e.g., stickers) and toys. The materials and reinforcers used were determined based on the teacher's interview. Prior to the sessions, the researcher explained what to do through modeling scenarios with the peer. In the first two trials, the researcher gave

the tangible reinforcer to the peer and prompted him to say the child's name and assessed whether the target participant looked in the direction of the peer. In the last two trials, the researcher gave a toy to the peer and prompted him to say the child's name and assessed whether the target participant looked in the direction of the peer. Both target children responded appropriately to at least three out of four bids of attention in at least one trial each (toy and reinforcer). For Miles, he responded appropriately to 5 out of 8 bids of attention across all trials and Louie responded appropriately to 6 out of 8 bids of attention across all trials.

Baseline

Baseline conditions were conducted during free-play period in the classroom. Using a multiple probe design, baseline data were concurrently collected across two target children's levels of stay, play and talk behaviors. Peer participants SPT data were also collected to measure for fidelity of procedures. Because SPT was implemented in a class-wide context, for the duration of the study, we collected data on one child (and his assigned peer) on some school days and the other child (and his assigned peer) on other school days.

Prior to the session, children were assigned buddies (e.g., "Before you all go, these are friends you can play with in the centers!") and teachers were briefed not to prompt or interfere with social interactions unless deemed necessary for safety measures (e.g., child displaying aggression, property discussion or child in harm's way). The researcher also asked the target child and peer if she can take a video of them and clip mics doing buddy time for consent. The session started when the teacher says, "Okay,

friends. It's time to play!". A secondary researcher recorded 10- min videos during free-play period while the primary researcher and other teachers assisted non-target children dyads. All baseline session videos were viewed by secondary coders to confirm the non-interference and absence of intervention implementation by the teachers or researcher on target child dyads during baseline probes, unless deemed necessary for behavior management.

Training

Whole group training sessions included all children in the class, including target and peer child participants, to improve maintenance and generalization of skills (Milam et al., 2021). The duration of the whole class training session ranged from 15 to 20 min and occurred on a large rug in the classroom where large group activities occurred. All training sessions were recorded using a video camera.

The sessions were planned to sequentially teach SPT behaviors to children using visual aids, role-playing and practice. The first session introduced ways how to stay with friends, the second reviewed staying and introduced how to play with friends, and the third one reviewed staying and playing, and introduced talking with friends. During whole class training sessions, the teachers were involved in the activities to promote generalization and maintenance. The researcher briefed the teachers on the general protocol and described what the teacher should be doing in each session. These activities included role-playing scenarios with the researcher and facilitating guided practice.

The whole group training session procedures included: (a) reading a scripted picture guide on the importance of being a good friend; (b) review of the previously

taught strategies (if applicable); (c) introducing the new strategy using novel visual aids and using distinct picture samples; (d) explaining the importance and effects of the strategy in simple child-friendly terms; (e) modeling examples of how to perform the strategy with the teacher; (f) providing guided practice opportunities for the children to display skills and (h) reviewing the skills taught.

During the practice segment, students were assigned to a peer to practice strategies for 5 min in a free-play setting[HML3]. This took place one day prior to intervention implementation. The lead teacher assisted non-participant group dyads, while the researcher assisted with target participant dyads. Since Miles typically received 1-on-1 assistance from a teacher during this time, the teacher also prompted him and his assigned peer during the training session. The training session concluded when the researcher provided children with reinforcement (e.g., stickers) for participating in the activities. See Appendix H for detailed training protocols for each whole group training session.

Intervention

SPT intervention sessions occurred following training sessions for 10-min during daily free play activities. The researcher briefly explained the use of the visual timer, the token board and reward contingency to the class (e.g., "when the timer goes off, it's time to come back to the mat and count our stars to see if we can earn a prize!"). The session began when the implementer gathered all the children on the mat and said "*It's buddy time! We are going to stay, play and talk with our buddies for 10 minutes*. *You can go!".* If there was an absentee, the researcher assigned other peers into triad groups, but

retained the target children and their peers in dyads. The researcher set the visual timer for 10-minutes and the groups played in the centers and with the toys and materials in the classroom. The teachers were briefed to refrain from interacting with the target child dyads, except to prevent or respond to challenging behaviors. The researcher provided descriptive feedback on a variable 2-min interval to each participant[HML4] dyad and provided a token if SPT behaviors are displayed. The teachers were tasked to provided tokens to non-target children dyads if they observed SPT behaviors. Thus, each dyad in the classroom had 5 opportunities to earn reinforcement for engaging in target behaviors, with the researcher providing reinforcement to the two target dyads and the teacher and assistant teacher providing opportunities to non-participating peers (3-4 additional dyads). During intervention, participants who completed their token board (i.e., earn all five stars) after the session were allowed to select a small prize from a selection of 2 reinforcement choices that rotated every other week to maintain novelty (e.g., slap wrist bands, erasers and stamps, etc.) and activity cards (e.g., hand-drawn stamps, bubble party) based on the student and teacher-reported preferred items. In the event participants earned four or fewer stars, they were given positive descriptive feedback and recognition for participating.

Modifications

Schedule of reinforcement for Miles was modified from a 2-min variable interval schedule (VI-2 min) to a 1-min variable interval schedule due to Miles's consistent movement through the centers (i.e., wandering), which made "staying" with him more difficult for peers. In addition, a modification was made for the coding definition of Stay

for Miles and his peer. It was observed that Miles would walk away from peers who attempted to approach his personal space therefore could not always meet the 3 ft requirement. The implementer decided to modify the rule, wherein Miles and the peer would be considered staying if oriented towards each other and within the same center in order to respect his preference for personal space. Finally, the implementer also prompted Miles's peers with more specific gesture initiations (e.g., offering a toy while saying "here, Miles!", tapping his shoulder, guiding his hand to manipulate another toy) and descriptive phrases they can use to talk about their play when interacting Miles (e.g., "Look at what I'm doing! I'm flying a plane!").

During the STAY condition, the researcher displayed a visual of staying with buddies, and provided feedback to each dyad every 2 minutes (5 times each per dyad, 10 times for Miles's dyad). The researcher provided a token to the buddies if they were staying next to one another. If the target child and peer were not staying together, the researcher implemented a system-of-least-prompts procedure which included a non-controlling prompt (e.g., visual and vocal prompt) and controlling prompt (e.g., model) with a 10-sec delay in between each prompt. The researcher implemented the non-controlling prompt (verbal and visual) after 10-sec of no observable target behaviors using a verbal and visual prompt (e.g., "*Remember, we are staying with our buddies*" while pointing to the visual). If peer partners appropriately responded, the researcher provided positive descriptive feedback and rewarded them with a token. If they did not engage in the target behaviors, the researcher provided the controlling prompt (model prompt) to further assist, depending on the context (e.g., "*You can stay near your buddy like this*"). If they engaged in the target behavior after the controlling prompt, the

researcher provided a token. When the target participants did not engage in the behavior after the controlling prompt, they were not rewarded a token. After 10-min, the researcher gathered the children back to the carpet, provided brief social praise and concluded the intervention. The researcher provided participants the opportunity to choose reinforcers from an array of tangible items.

During the PLAY condition, the researcher displayed the visuals of staying and playing with buddies then followed the same procedures of the previous condition. The researcher provided a token when the target child and peer were staying and playing with one another. When the target child and peer were staying together but not playing, the researcher implemented the same system-of-least prompts procedure (e.g., "*Good job staying with your buddies! Remember we are playing with our buddies too*"; *"You can roll your car like his car like this, vroom!")*. Similar procedures of reinforcement to STAY were implemented after the 10-min session (e.g., providing terminal reinforcement).

During the TALK condition, the researcher displayed visuals of staying, playing and talking with buddies. If the target child and peer had been staying, playing and talking the researcher provided a token. The same prompting procedure was implemented if the target participants and peers did not engage in talk behaviors (e.g., "*Good job staying and playing. Remember we are also talking with our friends!*"; "*You can ask for a turn by saying "Can I have a turn please?*"). Terminal reinforcement procedures as previous conditions took place at the end of the intervention.

During the intervention, teachers in the classroom were tasked to provide tokens to non-target participant groupings when they noticed SPT behaviors but to refrain from

prompting social interactions (e.g., prompting kids to play with their buddies, stay with them and talk about what they are doing) and to only provide descriptive feedback on the targeted behavior(s) that have already been explicitly trained (e.g., stay, play, talk). The teacher assigned to assist Miles 1-on-1 was asked to only redirect problem behavior (e.g., blocking a hit, grab or access to video camera, massaging back to ease tantrums) and prompting use of AAC device. Teachers in the class were allowed to assist children with gathering materials, helping support problem solving if necessary and redirect challenging behaviors. The classroom rules were still implemented during buddy time.

If a target child dissented from the study (e.g., refused to wear the mic, say "no, stop it" to filming or refused to join buddy time), the researcher made two attempts to invite the child to participate. If one target child dissented from the study on a given day, the researcher recorded the other child. If both children dissented from the study, the researcher did not record a session for the day. If a peer dissented, the researcher made the same number of attempts to invite the child to participate. If the peer continued to refuse participating, the researcher assigned a new peer buddy to the target child and moved the non-targeted participants into triads. Additionally, non-dyad participants formed triads when there were absentees in the class. The researcher will exercised professional judgement to determine which peer got partnered with the target child in the event there were unforeseen absences and restrictions to pairings. If target participants chose to assent into the study, they were paired with their initial buddies and can earn tokens for the remainder of the session (e.g., if they joined at the 4^{th} minute, they earn up to 4 tokens only). Buddies who were asked to adjust were given positive praise and social

attention from the teacher and implementers. If a peer assents into the study, they will be placed into a triad with other non-targeted participants.

Maintenance

Maintenance data on target children's levels of social engagement, initiations and responses were collected in January 2023, a 4-weeks after final intervention session. The classroom teacher, previously trained in the SPT study protocols, conducted the SPT sessions. The classroom teacher assigned partners based on original target participant and peer groupings and made a general announcement about stay, play, talk (e.g., "Okay, it's buddy time. It's time to stay, play, and talk to your friends"). Throughout all maintenance sessions, the classroom teacher chose to implement the reinforcement system. Data gathered from maintenance sessions allowed the researcher to objectively measure the sustainability outcomes of the intervention over time. A total of 3 maintenance sessions were conducted, two sessions for Miles and one session for Louie who is the main participant of the study.

Procedural Fidelity

Procedural fidelity data were collected for at least 65% of sessions across all conditions, training sessions and implementers by a non-implementing data collector. The researcher's fidelity during baseline, training and intervention sessions were collected and assessed through the video recordings. Procedural fidelity was measured and reported separately across each participant, behavior, sessions and overall sessions. Procedural fidelity will be calculated point-by-point basis (correct behaviors/[correct + incorrect

behaviors] * 100) for each behavior. After data collection, the researcher will review the procedural fidelity data before beginning the next session.

For whole group training sessions, implementer behaviors were: (a) reading the scripted guide and introducing buddy time, (b) reviewing previously taught behavior (if necessary), (c) introducing and describing the behavior with examples, (d) modelling behavior with the teacher, (e) sorting children into groups and assigning target children to teacher's group, (f) practicing behavior and providing feedback, (g) reviewing behavior visual and (h) providing reinforcement. See Appendix I for training session procedural fidelity checklists.

For SPT intervention conditions, implementer behaviors pre-session, during session and post-session were measured. Pre-session behaviors included (a) reviewing what condition and expectations (e.g., "*Today, we are going to stay with our buddies. When we stay with our buddies, we can earn tokens for being good buddies*"), (b) presenting choice of terminal reinforcer (s), (c) setting the visual timer and (d) conducting the sessions for at least 10 min. During the session, the implementer's adherence to providing positive descriptive feedback and the token was scored every 2-min interval for the target participant dyad. The data collector scored YES if the participant was engaging in the target behavior and NO for not engaging. Following participant behavior, the data collector would score implementer behaviors (e.g., providing a token, providing visual and verbal prompt and providing a model prompt) if they occurred or not. Implementer behaviors were scored depending on the expected implementer behavior for that specific condition and participant behaviors. For instance, if the target child was not staying (e.g., score "NO") and the implementer gave him a token (e.g., score "YES"), then that is an error. Only

implementer behaviors were scored for percentage. The implementer's average procedural fidelity across training sessions was 100%. Across conditions, the average procedural fidelity was 96% with a range of 78-100%.

Social Validity

The researcher evaluated the participants' preference of play: if they would like to play "buddy time" or play typical free-play activities (baseline) in a post-intervention survey. The researcher will record which participants, including target children, who prefer to play "buddy time" and those who preferred to play in baseline conditions individually. Participants were asked to pick whether they like to play in "buddy time" or "free-play time". The implementer recorded each participants' response using a social validity chart (See Appendix K).

RESULTS

Data Analysis

Data were graphed immediately after every baseline, intervention, and maintenance session. Data were collected continuously across behaviors and conditions (Gast et al., 2018). Formative analysis was used to make decisions about changing conditions, evaluate ongoing needs, and make data-based decisions during the study. Condition changes from baseline to intervention occurred when participant levels of behavior displayed a clear change in level for a minimum of three consecutive data points. Intervention on successive behaviors were introduced when data for the previous behavior displayed a change in level and stable trend from baseline condition for three consecutive data points. When baseline data of SPT behaviors were highly variable, baseline levels were extended until data stabilized. Condition change from intervention to maintenance took place when all SPT behaviors displayed stable trend for at least 3 consecutive data points.

Formative data analysis was conducted after each session within and across conditions. Within conditions, data were analyzed for level, trend and variability/stability. For data across conditions, data was analyzed for level, trend, variability/stability, overlap between data points across conditions and immediacy of change with the introduction of the intervention. Vertical analysis was used to analyze data across tiers of behaviors and across participants. Data was measured for consistency of level, trend

variability/stability, overlap and immediacy of change across conditions and tiers. Formative analysis is critical to facilitate informed data-based decisions to ensure participants benefit from their involvement and to inform the need for individualization (Barton et al., 2016). Summative visual analysis occurred following study completion across tiers and participants to determine functional relation between SPT behaviors and assess the magnitude of the effect (Gast et al., 2018). Data was analyzed in two replications of effect across tiers.

Miles

As shown in Figure 1, only one baseline data point was collected for Miles which was recorded at 0 and demonstrated an immediate change in level upon introduction of the intervention. This was due to the number of absences and therapy pull-outs during the scheduled class-wide buddy time. Stay behaviors were stable with an average of 64.5% (range=63-68%) for four consecutive intervention sessions, with a slight increase by session 5 under a VI-1 min reinforcement schedule. By the 6th session, stay behaviors displayed 100% in levels of responding and remained stable at high levels of responding (average= 95.2%, range= 91-97%) with no overlap for four succeeding sessions.

Baseline for Play behaviors for Miles was at 0. The first five intervention sessions were at low levels between 0-35% of intervals. Data were variable with an average of 61.33% (range=25-93%) wherein there were initially low levels of play behaviors (25%) and overlap upon the introduction of the intervention, followed by a significant increase in level for the second session (93%). By the end of the play intervention, play behaviors

decreased to moderate levels of responding (66%). During the talk intervention, play behaviors displayed a variable trend with no overlap (average=67.66%, range=51-75%).

As shown in Figure 2, baseline data for Miles's Peers' talk behaviors remained at low levels throughout the baseline session and stay conditions (average=1.33, range=0-3). Only two stay sessions were recorded for peer talk interactions due to audio technical difficulties in the third session. During the play intervention, peers' number of interactions were variable, with two out of three play sessions displaying a range of 16-20 interactions each session. Upon the introduction of the talk intervention, peer interactions displayed variable trend of talk behaviors ranging from 20-29 interactions each session, with minimal overlap.

Using vertical analysis, an immediate change in level and potential covariation were detected upon the introduction of the stay intervention on play behaviors. On the second session of the new reinforcement schedule of VI-1 min, both stay and play behaviors showed a slight increase in trend. Play behaviors were variable throughout the stay intervention and displayed an increase in level of responding and no overlap following the 7^{th} intervention session. When the talk intervention was introduced, Miles's stay and play behaviors maintained high to moderate levels of responding and Miles's peers' talk behaviors followed a similar increasing trend to that of Miles's play behaviors. Because Miles had only a single data point in all tiers before beginning Stay intervention, it is difficult to assess confidently that a functional relation existed, as vertical analysis of potential covariation between tiers was compromised. Additionally, maintenance data gathered is insufficient to determine actual maintenance of skills due to the lack of three data points.

Maintenance data for stay, play and talk behaviors were collected 4 weeks following the last intervention session. In Maintenance conditions, both sessions demonstrated an average of 94.5% (range= 89-100%) of stay and 77.5% (range= 71-81%) play behaviors on an increasing trend. There was overlap and behavior covariation detected for both behaviors. Peer talk data demonstrated an average of 20 instances of interaction across two maintenance sessions.

As shown in Figure 3, count-based measurement was used to collect data on the number of initiations and responses of Miles's peers during the talk condition. 0 initiations and responses were recorded during baseline sessions. Upon introduction of the stay condition, there was a minimal increase in verbal initiations and no change in responses and narrative play interactions. In the play condition, Miles' peers displayed an increase in verbal and gesture initiations, ranging from 9 to 10 gesture initiations and 13 to 16 verbal initiations each session. Verbal and gesture responses, as well as narrative play interactions, maintained minimal to no instances throughout the intervention. Upon the introduction of the talk intervention, levels of verbal initiations displayed a clear change in level and maintained an increasing trend across three sessions, with no overlap (average=23.66, range=20-27). Gesture initiations also displayed an increase shortly after with minimal overlap from the previous condition (average=9, range=0-14). Across the intervention, peers would engage in more instances of verbal initiations than gesture initiations to interact with Miles, while following a similar trend. In the maintenance condition, peers engaged in almost equal amounts of gesture and verbal initiations. They used an average of 9.5 (range=7-12) gestures initiations and an average of 9 (range=6-12) verbal initiations when attempting to interact with Miles. Additionally, they demonstrated

at least 3 narrative play statements when they would be engaged in the same play schema as Miles.

Louie

As shown in Figure 4, baseline data for Stay behaviors for Louie remained low and relatively stable. Baseline data for stay behaviors demonstrated an immediate change in level upon presentation of the intervention. During the intervention, stay behaviors maintained high with a slightly variable trend and no overlap. In the 6th session, there was a slight decrease in level to 70%. However, the following session displayed an immediate increase and maintained relatively stable and high levels of stay behaviors through talk intervention sessions with an average of 98.66% (range=95-100%).

Baseline data for play behaviors remained at low stable levels at 0 until the introduction of the intervention for stay behaviors. There was an immediate and clear change in level, followed by variable data with an average of 56.5% (range=39-74%) across 4 sessions. During the 3rd baseline session, play behaviors were not recorded due to technical audio difficulties. Upon the introduction of the play intervention, there was an initial decrease in play behaviors (34%), followed by an increasing trend with significant overlap compared to baseline sessions. By the 7th session, succeeding play behaviors were variable but maintained similar levels of responding with an average of 75.83% (range=66-89%) until the end of the condition. Upon the introduction of the talk intervention, play behaviors were variable but remained at similar moderate to high levels of responding (average= 89.4%, range= 81-98%), with minimal overlap.

Baseline data for Talk behaviors for Louie were variable, with an average of 22.5 instances across 19 sessions (range=3- 37). Baseline sessions 1 and 2 displayed 0 talk

interactions. Talk interactions displayed an immediate change in level upon the introduction of the stay intervention, followed by a stable decreasing trend for three consecutive sessions. When the play condition was introduced, data were variable with an average of 18 talk interactions (range=3- 31). Towards the end of the play intervention, the number of talk interactions displayed a stable decreasing trend from a range of 31 to 23 interactions per session to 9 interactions per session. Data for peer interactions were variable, with an average of 15-16 instances (range=4 to 42), across 12 baseline sessions. Upon the introduction of the talk condition, data remained variable and displayed overlap (average=31, range=22-37), but remained at higher levels compared to majority of the baseline sessions. Across all intervention sessions, Louie's number of interactions were slightly more than that of his peer's for 56.25% of sessions (9/16) and matched the same number of peer interactions for 18.75% of the sessions (3/16). In the talk intervention, Louie's interactions showed a variable trend but maintained similar levels of responding, ranging from 24 to 37 talk interactions per session. In the 4th intervention, talk behaviors decreased to 24 instances of interaction. This occurred following a long school break. The succeeding four sessions displayed an average of 30 interactions per session (range=24-35), with stable increasing levels, minimal variability and significant overlap from baseline.

Using vertical analysis, the immediacy of change in stay and play behaviors upon the introduction of the stay intervention displayed behavior covariation. High levels of stay behaviors were accompanied by moderate levels of play behaviors on a variable trend. When the play intervention was introduced, stay behaviors maintained high levels of responding while play behaviors initially decreased to lower levels then gradually

increased to that of similar levels of baseline. Upon the introduction of the talk intervention, stay and play behaviors maintained moderate to high levels of responding with variability for play behaviors and stability for stay behaviors. There was overlap for both play and talk behaviors compared to baseline. Throughout the intervention, Louie demonstrated slightly more talk interactions than his peer in sessions that demonstrated lower average play behaviors (average=72.55, range=34-98). Sessions wherein his peers demonstrated a greater number of interactions correlated with higher levels of play behaviors (73%, range=66-95%).

Maintenance data for stay, play and talk behaviors were collected 4 weeks following the last intervention session. Due to the lack of attendance and availability of the lead teacher to include buddy time in their class schedule, there was only one maintenance session for Louie. Stay and play behaviors both maintained high levels of responding and talk behaviors increased by 13 instances of interaction from the last intervention session.

As shown in Figure 5, Louie had no initiations, responses or narrative play instances that were recorded during stay baseline sessions. No talk behaviors were recorded for the 3rd Stay baseline session due to audio technical difficulties. Upon the introduction of the stay condition, there was an immediate change for verbal responses (average=6, range=1-9) and initiations (average=8, range=2-14) and narrative play (average=2, range=0-5) interactions. Gesture initiations and responses remained at 0 instances during baseline and trended on low levels throughout intervention conditions (gesture initiations average=2, range=0-7; gesture response average=0.6, range=0-3). Louie displayed an increasing trend of verbal initiations at the beginning of the

intervention, and maintained moderate levels of verbal initiations throughout the play intervention compared to other interactions, ranging from 2 to 14 instances each session (average=9). Upon the introduction of the talk intervention, verbal initiations maintained similar levels of responding (average= 11, range=3-17) for two consecutive sessions, and decreased by the third talk session with overlap. Towards the end of the talk intervention, Louie engaged in an average of 13 verbal initiations each session with a range of 10 to 17. Verbal responses data were variable throughout talk baseline sessions (average=7, range=0-21) and displayed a slight increase in trend, similar to verbal initiations for the first two talk sessions (range=13-16). Verbal responses trended higher levels of responding compared to initiations in the talk intervention (average=18, range=12-23). After 4 weeks, Louie engaged in more verbal responses than verbal initiations at relatively similar levels as the intervention.

Social Validity

Results show that 7 out of 11 participants preferred buddy time to morning free play. Some peers mentioned that they enjoyed buddy time since they got to have a toy (reinforcement) and have a buddy and make things together, and they got to play with all their friends and try new centers. One peer mentioned that they got to play with Miles and use his sensory toys. Between the two target participants, Louie chose buddy time over morning free-play period sharing that he enjoys making art with a buddy and that they get to copy each other. 4 out of 11 participants preferred morning free-play period, including Miles. Peers shared that they liked free-play period more because they got to do what they want and that they don't have to agree (on what center to go to or what activity

to do together). Another peer shared that they like morning free-play period more because they got to play with their "luvies" or toys from home and they were not allowed to do so during buddy time. Objective measurement of participant preference during intervention implementation is crucial information for interventionists to plan and conduct meaningful and acceptable learning opportunities for primary consumers (e.g., the students) (Gast et al., 2018).

The classroom teachers were also asked whether they found the intervention useful and effective in increasing social interactions. They both found the intervention extremely effective and helpful to increase both target children and peers' levels of play and talk interactions as it provides an opportunity for all the students to interact with peers who they typically do not play with. They also shared how they have been observing peers include target participants in their play outside of buddy time over time. Social validity chart can be found in Appendix K.

Interobserver Agreement

IOA data on SPT behaviors were collected for 30.55% of sessions distributed across participants and conditions. Due to frequent absences and therapy pullout sessions, Miles had lesser sessions and conditions measured for IOA, including baseline sessions. Therefore, IOA was not recorded for Miles's sessions. Additionally, the lack of sufficient baseline sessions resulted to one session having collected IOA data at 97% for Stay and Play behaviors and 100% for Talk behaviors, with an average of 98.5%. Average IOA for intervention sessions was 94% (range= 90-96%) for Stay and Play and 77% for Talk behaviors (range= 65-86%). IOA was not collected during the maintenance condition due

to researcher time constraints. Low IOA for talk behaviors were due to inconsistencies with interpretation on the length of the interaction (e.g., primary would count a long interaction as one and secondary would code as two separate instances), interpretation of slightly inaudible phrases (e.g., primary researcher could understand but secondary researcher couldn't decipher), and interpretation of non-initiation or non-response interactions (e.g., "ooh car", "fishy!! My fishy!"). The researcher retrained the secondary coders once over the course of the study to review the coding protocol and discuss discrepancies. Average IOA for Stay and Play behaviors across baseline and intervention sessions are 94% (range=90%-97%) and 82% (range=65-100%) for Talk behaviors. The mean average for all behaviors across experimental sessions is 88% (range=65-100%). A more detailed description of results is depicted in Table 7.

Procedural and Implementation Fidelity

Implementation fidelity was collected for a total of 65% of sessions across conditions for Louie with an average of 96% (range=78-100%). To select which videos would be measured for IF, videos were randomly selected using a number generator. However, the researcher purposefully chose two sessions with low IF to identify the reasons for low fidelity in the classroom setting. The reasons identified were timing of token delivery between intervals (e.g., providing two tokens within one VI-2 min) due to providing attention to another group (e.g., providing descriptive praise), providing behavior management for the dyad and others (e.g., helping students problem solve) or delayed response (e.g., child was prompted during the interval, but took longer to respond through the prompting sequence). This happened in sessions where a teacher or adult left the room in the middle of the intervention. Despite the low IF, the intervention still

produced positive social outcomes for both target children[HML5]. All videos selected have been Louie's sessions for he was the main target participant of the study. Average implementation fidelity of across all training sessions was 100%. Procedural fidelity for peers was collected for 33.33% of sessions across conditions and participants with an average of 97% (range=88-100%). During the stay condition, the implementer provided an average of 2 visual and verbal prompts and 0.3 model prompts across three sessions. During the play condition, the implementer provided the same average (e.g., 2) of visual and verbal prompts and 2 model prompts across six sessions. In the talk condition, the implementer provided an average of 2 visual and verbal prompts and 1.5 model prompts across four sessions. In maintenance, the classroom teacher provided 3 visual and verbal prompts and 1 model prompt. A more detailed description of implementation fidelity, procedural fidelity and prompts used during the intervention can be found in Table 8, 9 and 10 respectively.

Discussion

Summary of findings

This study provides further evidence of the effectiveness of SPT as a class-wide intervention. Positive outcomes were identified for both participants and their peer buddies. Although covariation between tiers (for both participants) and a limited number of data points (for Miles) limited confidence in the presence of a functional relation, levels of stay, play, and talk were consistently higher during intervention sessions than during initial baseline sessions. In addition, most of the children preferred "buddy time" and suggested ways in which it could be modified to further increase social validity.

The study found partially similar findings to previous SPT research. The study found that SPT with a behavioral skills training component can effectively increase and maintain high levels of stay behaviors, but insufficient evidence to prove functional relation for play behaviors due to high levels of covariation (Osbourne et al., 2019). However, this finding indicates that perhaps close proximity to peers is enough to encourage and maintain stable levels of play and talk interactions without additional training. Additionally, when participants were asked some ways we can stay with their peers prior to training sessions, they responded with naming some behaviors that could be considered as play (e.g., "playing with them", "sharing toys with them", "offer new toys"). This supports previous SPT findings on the considerations practitioners should be aware of when designing SPT interventions, training sessions and coding protocols to

ensure that a variety of stay, play and talk behaviors are modified and adapted based on your participants' current repertoire (Osbourne et al., 2019; Severini et al., 2017). SPT reviews have also suggested contextual and procedural factors that may affect magnitude of behavior change (Ledford & Pustejovsky, 2021). Explicit training and modelling may be needed during training sessions to create salient distinctions between staying, playing and talking, especially for children with more language support needs (Osbourne et al., 2019; Severini et al., 2017; Milam et al, 2018). Adult prompts gradually moved from a more controlling prompt to less intrusive throughout the study which support similar findings in previous SPT studies of prompt fading (Milam et al., 2018; Barber et al., 2016; Osbourne et al., 2019; Hughett et al., 2013; English et al., 1996). This study also provides similar findings to previous research done with children with ASD wherein consistent implementation of prompting sequences and adapted schedules of reinforcement are effective in increasing stay, play and talk behaviors (Hughett et al., 2013; Milam et al., 2021; Osbourne et al., 2019).

As with previous research, this class-wide SPT intervention was seen as a socially valid by the classroom teachers and produced socially significant changes in both target children and peers (Milam et al., 2021). Findings suggest if the intervention is seen as socially valid, implementers could potentially increase social validity by allowing participants to be paired with buddies who share the same play interests or schemas. [Je6]This finding also extends research on the effectivity and social validity of SPT interventions when it is conducted as class-wide activity that occurs routinely in the children's natural environment (Kohler et al., 2007; Milam et al., 2018). A noticeable change in peers' willingness to include target participants in free-play and outdoor play

was reported by the teachers after the introduction of buddy time. This could potentially be attributed to the opportunity "buddy time" provides to peers on how to interact with buddies who have different play interests and rates of talk interactions for a specified amount of time. This study also extends SPT participant social validity and the effects of providing choice of preferred buddy to levels of stay, play and talk behaviors. Only one other SPT study measured for participant social validity and the reasons for their preference (Milam et al., 2018). We measured 7 out of 11 children preferred buddy time to morning free-play periods because of the reinforcer, opportunity to play with new buddies and centers and imitating peers in their play. Interestingly, providing a child agency to select their peer may have positive effects towards increased rates of interaction. For instance, Louie was repeatedly requesting to be buddies with Miles so the implementer allowed him to be paired up with Miles for one talk session. Louie demonstrated high levels of stay, play and talk behaviors, and even higher levels of verbal and gesture initiations compared to when he was paired with other typically developing peers. Unlike previous research, these findings show that SPT paired with explicit models during training and clear prompts on how to initiate with peers can increase the number of verbal initiations of a target child over time (Barber et al., 2016).

Another important outcome of the study was the effect of center choice to levels of play and talk behaviors. Louie preferred to stay in the art center for most of the buddy time sessions. Since art is generally known to be a quiet, solitary and sit-down activity, this resulted in higher levels of stay behaviors since he and his peer would be mostly seated. Play behaviors were variable due to his level of engagement in what he was creating (e.g., when a peer across the room said something, he would look at them for at

least 40-seconds). Lastly, findings showed that Louie would demonstrate higher numbers of talk interactions when he had generally lower percentages of play. Louie would verbally interact with his peers, observe what they were doing for some time and resume playing with them. This supports previous research on the executive functioning skills of children with ASD (e.g., attention, shifting focus and working memory) and their varied levels of engagement in a busy classroom (Kouklari et al., 2018) which can inform future SPT adaptations to have more inclusive definitions or measures of play and talk behaviors.

Limitations

Several limitations occurred during the study. First, similar to previous SPT research, the coding protocol required several adaptations for measuring talk behaviors based on the participants' behavior repertoires. Talk behaviors considered both time and context of the interaction which resulted to a significant number of gray areas that were left up to the coders' professional judgement to determine whether it could be considered a talk interaction or not (e.g., one would say the phrase was intended for the peer, the other says it was toward the teacher). To add, IOA for talk behaviors in sessions with low numbers of interactions (e.g., 10 or less) were sensitive to a single disagreement (e.g., if there were only 4 instances, having 3 out of 4 agreements would result to 74%). To address the issue, the implementer only re-trained secondary coders after two consecutive sessions of low IOA (below 80%) with 10 or more interactions. As for stay and play behaviors, levels of on-task engagement were not measured and therefore affected coders' interpretation of certain play behaviors. This could be restricting for children with

ASD who have varied levels and topographies for engagement. There were also several modifications that needed to be made for Miles later in the study, since the behavior definitions did not reflect his current level of comfortability (e.g., proximity to personal space) and play skill repertoire. Further research and consideration are needed to measure levels of engagement, considerations of the qualities of talk behaviors and individual modifications for children with emerging social skills.

Another limitation is the procedural fidelity of the study. PF was taken 65% of sessions across all conditions for only one participant and may not reflect true fidelity. To add, PF was only measured with implementer behaviors and not individual peer behaviors since data collection was based on dyadic stay, play and talk behaviors. The implementer also only collected PF data for Louie who had a different reinforcement schedule (VI-2) and prompting sequence from Miles. Since Miles and his peer required a denser schedule of prompts and high-quality reinforcement, there were undocumented instances of in vivo modelling and descriptive feedback praise for his peers. Given that the study was conducted as a class-wide intervention, classroom and behavior management was needed from time to time which ended up impacting the immediacy of reinforcement to the target group. Additionally, temporary staff members would come to assist in class during buddy time and break protocol (e.g., interact with target dyads and prompt interactions) despite several reminders. This may have affected levels of responding peers would have with their buddies. However, despite the intervention not being implemented to fidelity, it was effective in increasing and sustaining moderate to high levels of stay, play and talk behaviors across sessions.

Third, there was an insufficient number of sessions for Miles due to the number of absences and therapy pull-outs during the scheduled buddy time. Because it was a class-wide activity, it was not possible to move the activity to an earlier or later time without altering the entire classroom schedule and affecting the routine. This did not allow the implementer room to adjust sessions to include him. However, given the small number of data collection sessions, Miles's increased levels of stay, play and talk behaviors were promising. It would have been helpful to have a longer period of implementation to see the development of skills throughout the school year. Additionally, maintenance sessions were not sufficient enough to determine whether behaviors successfully maintained for either participant. The lack of maintenance sessions was due to an altered classroom schedule and staff over the school break and frequent participant absences.

Finally, the participants' choice of centers and toys can greatly impact levels of talk. Louie's preferred center was art which is acceptably a quiet and solitary activity. This resulted into initial low rates of communicative exchanges, which prompted the implementer to encourage peers to interact with one another every so often. While the purpose of the study is to increase social behaviors, additional research and discussion may be helpful to determine whether prompting peers to talk to one another in "quiet" activities such as book reading or art, is socially valid. Perhaps modifying centers and/or activities such as closing the quiet cozy corner or working on shared art (e.g., working on something together) or modelling acceptable ways to interact in quiet activities (e.g., using gestures to communicate, complimenting a friend's work) during buddy time may be a better alternative to encourage pro-social behaviors.[TLLV7][Je8]. Some children may prefer these quiet activities, and may prefer to escape from peer interactions during some

parts of a free play period. Additional work is needed on the balance between encouraging peer interactions and independent decision-making and self-advocacy.

Implications for Research and Practice

This study has several implications on research and practice. First, SPT training sessions and prompting sequences should focus on specific and discrete ways to stay, play and talk with peers can positively impact the quality and frequency of social interactions for children with ASD. The study demonstrated a positive impact of individualized behavior skills training on the communication and play skills of all students with or without disabilities. The implementer used training sessions to model and expand on the current play behaviors in the classroom. It may be important to further adapt training sessions based on target children's current play and talk skill repertoire and teach peers functional ways to interact with them (e.g., imitating repetitive actions and expanding to functional play, using the talker or modelling signs to communicate, respecting personal space). Future SPT research could also address how to promote functional communication for non-verbal children and identify procedural and contextual factors that can positively impact behaviors. For instance, it was helpful for the children to distinguish that "staying" with a certain friend who prefers adequate personal space looks different from when they stay with another peer. Similarly, the study suggested that being in close proximity to a peer may be a salient opportunity to engage in peer interactions and play behaviors. Such information could be helpful to improving SPT implementation in class-wide settings.

The second implication is that class wide SPT interventions are still effective despite low implementer procedural fidelity. PF for the study was collected for only 33.33% across all sessions, therefore may not completely reflect all sessions that occurred throughout the study. Since only the implementer was trained to fidelity for the intervention and training sessions, the teachers and temporary staff may or may not have been prompting or reinforcing non-target children dyad groups for the other behaviors. Despite the lack of fidelity, target children's stay, play and talk behaviors continued to display a significant change in level and sustained behaviors throughout the intervention. Future research can further explore contextual factors that impact class wide implemented SPT outcomes and the effects of peer procedural fidelity in a naturalistic setting with multiple moving elements (e.g., student absences, therapy pull-outs, behavior management, change in staff). In the study, results show that discrete training and practice opportunities paired with a system-of-least prompts prompting procedure resulted in more intrusive prompts (e.g., modelling) for more complex social interactions (e.g., play and talk). Further research may examine this relationship further and whether more intrusive prompts, or rather less intrusive, may be needed for children with significant language support needs or behavioral support in certain conditions more than the others. Furthermore, researchers should examine the implementation of SPT behaviors in a variety of different settings and materials to determine intervention generalization.

Another implication of the study is the role of participant agency and its effect on levels of SPT behaviors. In the study, a participant presented higher levels of stay, play and talk behaviors, as well as verbal initiations and responses when he was paired up with

their buddy of choice. Further research should examine the effects of peer preference on stay, play, talk behaviors and on the development prosocial behaviors such as being flexible, engaging in problem solving and turn-taking. Such information would be essential in developing socially valid and purposeful interventions for children to develop meaningful friendships within their class.

Finally, while maintenance data have yet to be taken, it may be important to examine whether or not thinning reinforcement and rewards for interacting with peers is essential for maintaining desired behaviors. Forming relationships and developing friendships take time and may need substantial amount of external support at the beginning of the school year. Since this study was only implemented for a total of 28 sessions over 8 weeks and 3 days at the beginning of the school year, the implementer decided to continue providing reinforcement to encourage children's efforts to interact with randomly assigned peers during buddy time. Future research can investigate the benefits of conducting buddy-time over a longer period (e.g., more than 3 months) and the impact of the time of the school year as to when it has been introduced (e.g., at the beginning of the school year versus mid-year) on the development of positive pro-social behaviors and friendships.

Conclusion

The current study extends previous research by providing additional evidence of effectiveness SPT and class-wide interventions to increase social interactions. With behavior skills training, prompting procedures and systematic reinforcement, target children's levels of social interactions increased and maintained high levels throughout the intervention. Additionally, SPT intervention was seen as a socially valid intervention

to the participants themselves and resulted to significant increases in target child verbal initiations and responses. Further research is needed to increase child agency in SPT interventions and maintenance of behaviors in a variety of settings. Future research is also needed to develop individualized procedural and contextual modifications to training sessions and prompting sequences for non-verbal children and those with significant language support needs.

Table 1
Inclusion and Exclusion Criteria for Target Participants

	Inclusion	Measurement
	Descriptive Information	
Age	36 months or older	Teacher report (Appendix A)
Race, Ethnicity, Sex	No requirement	Parent report
Diagnosis	No requirement	Teacher report (Appendix A)
	Inclusion Criteria	
Play Level	Ability to engage in pretend play for at least 5 minutes	Teacher report (Appendix A)
Attendance	Regular school attendance, no more than 6 absences within 30 days; availability to devote 10 to 15 min sessions daily without interruption (e.g., appointments with related service providers) as teacher reported.	Teacher report (Appendix A)
Motor Level	Ability to move around the classroom centers and manipulate objects independently	Teacher report (Appendix A)
Expressive Language	Ability to answer questions with at least one intelligible word or gesture	Teacher report (Appendix A)
Peer Interaction	Interacts with peers at a low rate: "never" or "rarely"	Teacher report (Appendix A)
Peer Interaction (Probe)	Successfully responds to 3 of 4 probes	Probe sessions in classroom (Appendix B)

Table 2
Inclusion Criteria for Peers

	Measurement	Inclusion Criteria
	Descriptive Information	
Age	Teacher report (Appendix A)	36 months or older
Race, Ethnicity, Sex	Parent report	No requirement
Diagnosis	Teacher report (Appendix A)	No requirement
	Inclusion Criteria	
Play Level	Teacher report (Appendix A)	Ability to engage in pretend play for at least 5 minutes
Attendance	Teacher report (Appendix A)	Regular school attendance, no more than 6 absences within 30 days; availability to devote 10 to 15 min sessions daily without interruption (e.g., appointments with related service providers) as teacher reported.
Motor Level	Teacher report (Appendix A)	Ability to move around the classroom centers and manipulate objects independently
Expressive Language	Teacher report (Appendix A)	Ability to answer questions with at least one intelligible word or gesture
Peer Interaction	Teacher report (Appendix A) and Peer Individual Degree Centrality report (Appendix B)	Interacts with peers “often” or “very often” Likely to play with similar toys, in similar ways as target participant

Table 3
Target child participant demographics

Target child participant	Chronological age	Gender	Race
Target Child 1	60 months	M	Black
Target Child 2	56 months	M	White

Table 4
Peer participant demographics

Peer Participant	Chronological age	Gender	Race
Peer 1	58 months	F	2 or more races
Peer 2	64 months	F	White
Peer 3	57 months	M	White
Peer 4	59 months	M	White
Peer 5	58 months	F	White
Peer 6	56 months	M	South Asian
Peer 7	57 months	F	2 or more races
Peer 8	56 months	F	2 or more races
Peer 9	52 months	F	Hispanic

Table 5

Operational definitions, examples and non-examples of Stay, Play and Talk behaviors

Behavior	Definition	Examples	Non-examples	Not codable
Stay	Target child or peer is within a 3-foot radius of their partner: (a) in the same classroom center as the target child (e.g., construction zone, art center) or (b) oriented towards each other if centers are not clearly defined.	Target child standing, sitting, or lying beside their peer or either a target child or peer's arm/foot within 3 feet of the other's space.	Target child and peer being 3 feet apart from one another (5 feet for Miles and his peer); target child and peer is in a different space; Target child or peer have both feet/arms outside of their partner's space; The peer is in one center and the target child is leaning over a shelf (into another center) or standing outside the center area; dyad transitioning to another center together	If a target child or peer are off camera within the 3 feet of each other, it will not be coded (.e.g., camera turns the other way for a full interval not capturing dyad).
Play	Participants (a) appropriately manipulating the same or similar materials as their partner (e.g., toys and materials found in the same center that are functionally similar), (b) target child or peer playing with a functionally different toy or material, but in the same or similar manner as the peer (e.g., art or book), or (c) target child and peer sharing, exchanging or cleaning up toys or activities, (d) target child or	Target child handing peer a block; Target child coloring paper using markers and peer painting paper using a brush on the same artwork; Target child mixing in a bowl and peer placing food on a plate; Target child and peer taking a picture-walk with the same book; Target child and peer reading two separate books; Target child and peer gathering or cleaning	Target child building a block tower while peer plays with cars in parallel play in the same area; Target child coloring paper while peer cuts paper separately in the art center; Participants throwing or grabbing toys from each other (if such behavior is the only interaction occurring)	If a target child or peer are off camera or if hands manipulating objects are not visible during play (e.g., back of participant covering view of play), it will not be coded

	peer holding onto similar toys or materials within a center while looking at their partner's play, or (e) when participant is displaying a clear reach of materials or toys.	materials/toys; Target child holding a car while watching his peer roll a car in front of him		
Talk-Interaction	A verbal or non-verbal engagement with a peer buddy with the intention to communicate and receive or provide a reciprocal action.	Contributing a new play idea; responding to a question; tap on the shoulder; giving a high five; looking back at a peer when tapped on a shoulder; singing and chanting a song; telling their peer about their play	Inappropriate bids for attention (e.g., throwing, grabbing, screaming, hitting); interactions NOT directed to the buddy (e.g., directed to adult or another classmate in the classroom who is not his peer); Not appropriate vocalizations to play; inaudible sentences or phrases; singing, humming or chanting to themselves; engaging in self-talk or narrating play within their own play schema	If participants are not staying and playing, do not code talk; If the child is talking to an adult or a non-peer; If they child is inaudible; If the child is not within the frame, it will not be coded.

Table 6
Operational definitions, examples and non-examples of Talk categories

Behavior	Definition	Examples	Non-examples	Not codable
Initiations	Participant uses verbal or non-verbal language to initiate to peer buddy either with speech, sign language, or gesture attempts.	**Initiations** can be social interactions during play such as greetings, contributing ideas (e.g., "let's build houses!", "I can cook the meat", "Hey! Not yet!"), providing validating comments (e.g., "I think that looks nice") and praises, verbal and non-verbal requests (e.g., pointing, tapping or providing validating gesture) for a toy or assistance; reaching out and showing peer the toy or activity; Providing physical affection such as a hug or high-five; Asking a question about current activity.	Self-talk conversations or vocalizations (e.g., participant narrating his own play) and imitating peer or target child's exact statements, vocalizations (e.g., mmmm, ahhhh) or gestures; initiating to peers or adults who are not their current buddy	If a target child or peer are not audible through the video (e.g., audio glitch, muted video, loud background noise), and communication cannot be determined, it will not be coded.
Responses	Participant uses verbal or non-verbal language to respond to peer buddy either with speech, sign language, or gesture attempts.	**Responses** can be providing statements of acknowledgement (e.g., "yes, and then we can…"), agreement or disagreement in response to an initiation from a peer; returning a high-five or accepting a hug; taking a toy from peer offering it; child sits	Responding to other peers who are not their current buddy; Screaming and crying in response to peer initiation; When statement after peer initiation has no secondary indicator that it is a response (e.g., peer	

		on seat joining the invitation of peer; a statement with a secondary indicator that it is in response to peer's statement (e.g., "Let's go do the puzzles", "yeah, I want to do the bus puzzle")	initiation: "hey, let's play over here", target child non-response "I'm going to build a house")
Narrative Play	Participant uses descriptive narrative statements about one's current play or what they want to do within the same play schema as their peer	**Narrative Play** can be descriptive narrative statements about one's current play or what they want to do within the same play schema as their peer; singing and chanting songs together; Self-talk conversations or vocalizations about their play; vocalizing sound effects related to current play (e.g., target child says "vroom, vroom" when rolling a car); Both target child and peer are describing what they are doing without any secondary indicator of it being directed to one another (e.g., both children are playing and saying "get it back up" to a fallen boat repeatedly)	Repetitive sound effects not related to current play (e.g., saying "ahhhh", "mmmm" or "yay" when playing with cars); imitated phrases not related to current play (e.g., peer: "It's going to sink ahh", target child: "it's going to sink, it's going to sink, it's going to sink" while not actively sinking the boat)

Table 7
Interobserver Agreement

Participant	Baseline		Intervention		Average	
	Stay and Play	Talk	Stay and Play	Talk	Stay and Play	Talk
Louie (range)	97%	100%	94% (90-96%)	79% (65%-91%)	94% (90%-97%)	83% (65-100%)
Mean (range)	98.5% (97-100%)		86% (65-96%)		89% (65-100%)	

Table 8
Procedural Fidelity across sessions[TLLV9]

Target Child	**Baseline**	**STAY**	**PLAY**	**TALK**	**Maintenance**	**Average**
Louie	98%	99% (96-100%)	96% (88-100%)	93% (78-98%)	96%	96% (78-100%)

Table 9
Implementation Fidelity across training sessions

	STAY	PLAY	TALK	AVERAGE
Implementer	100%	100%	100%	100%

Table 10
*Prompts used across experimental sessions**

	Baseline (1)		Stay Intervention (3)		Play Intervention (6)		Talk Intervention (2)		Maintenance (3)	
Implementer	Visual +Verbal	Model	Visual +Verbal	Model	Visual +Verbal	Model	Visual +Verbal	Model	Visual + Verbal	Model
	0	0	4	1	10	8	3	4	0	10

**Only sessions wherein PF was measured*
*** Number of sessions are indicated within the parentheses*
**** All maintenance sessions were conducted by classroom teachers*

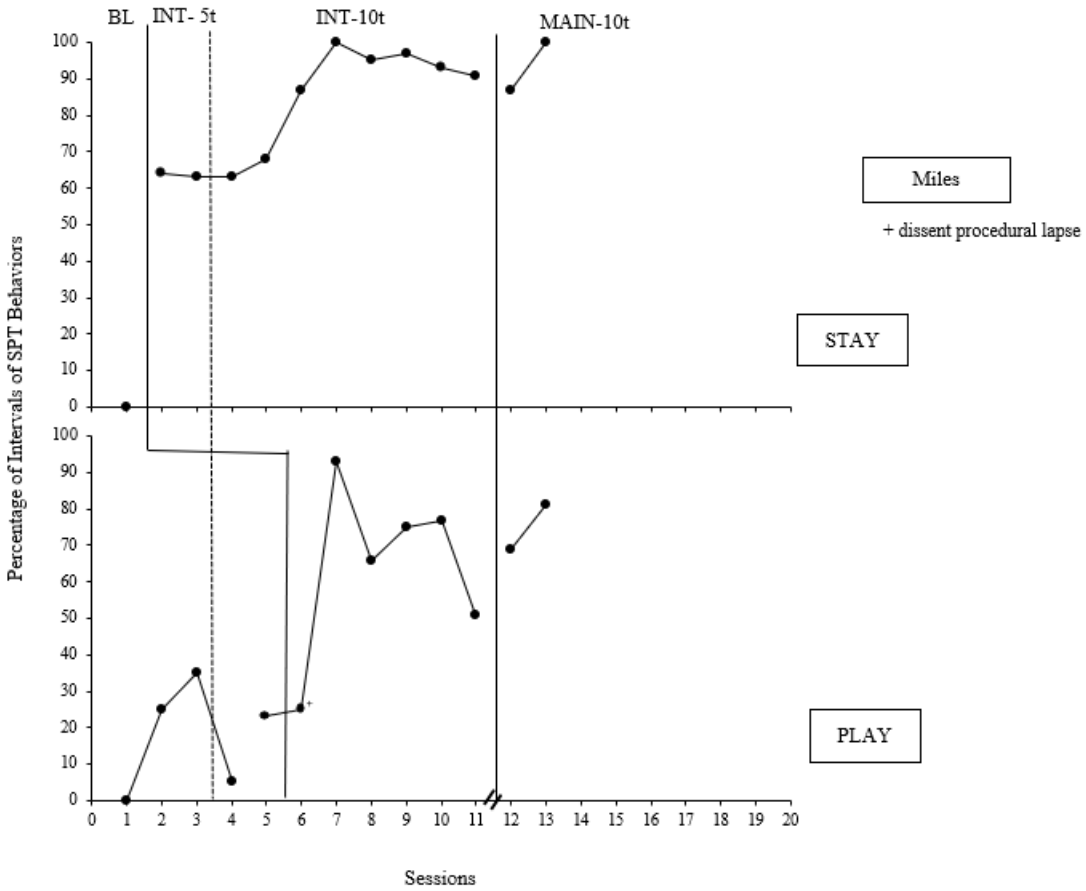

Figure 1. Stay-Play-Talk behavior results- Miles. Closed circles represent percentage of intervals of SPT behaviors during intervention sessions. Open squares represent the number of talk interactions of peer.

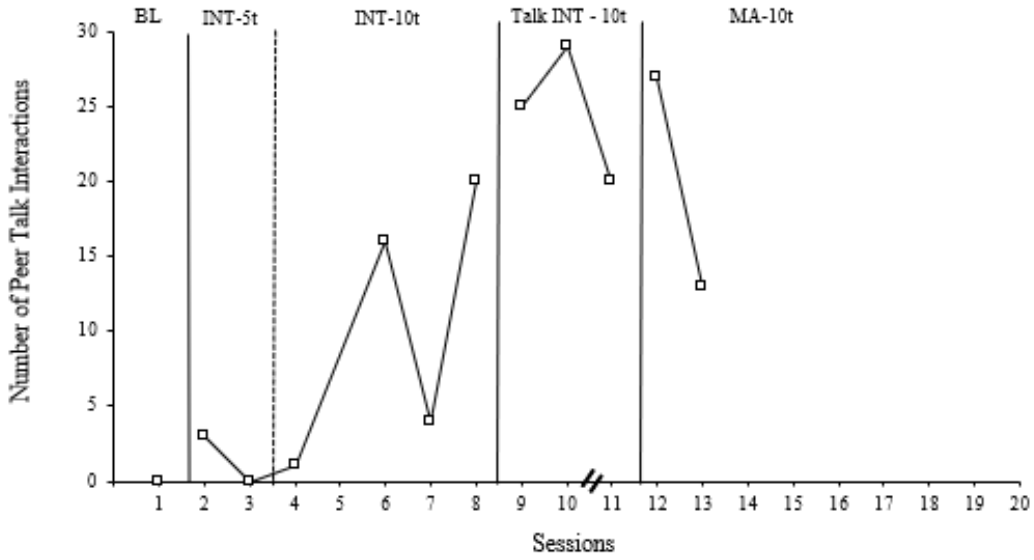

Figure 2. Peer talk interaction results-Miles. Open squares represent number of interactions Miles's peers demonstrated

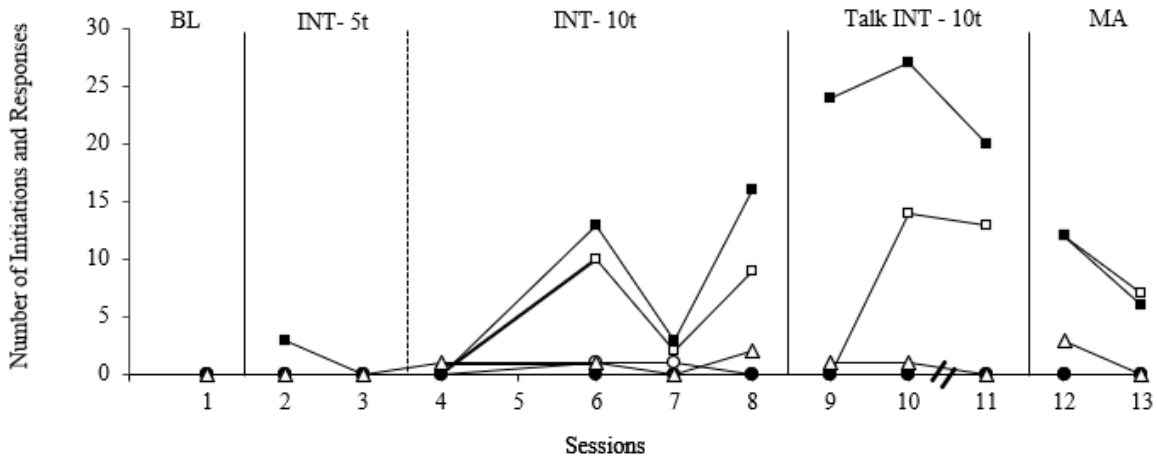

Figure 3. Number of Initiations, Responses and Narrative Play of Miles's peer. Open squares represent number of gesture initiations. Closed squares represent number of verbal initiations. Open circles represent gesture responses. Closed circles represent verbal responses. Open triangles represent narrative play responses. A single instance of talk could be recorded under multiple categories (e.g., if a child said "come here" and gestured, it was coded as both a verbal and gesture initiation[Je10][TLLV11]).

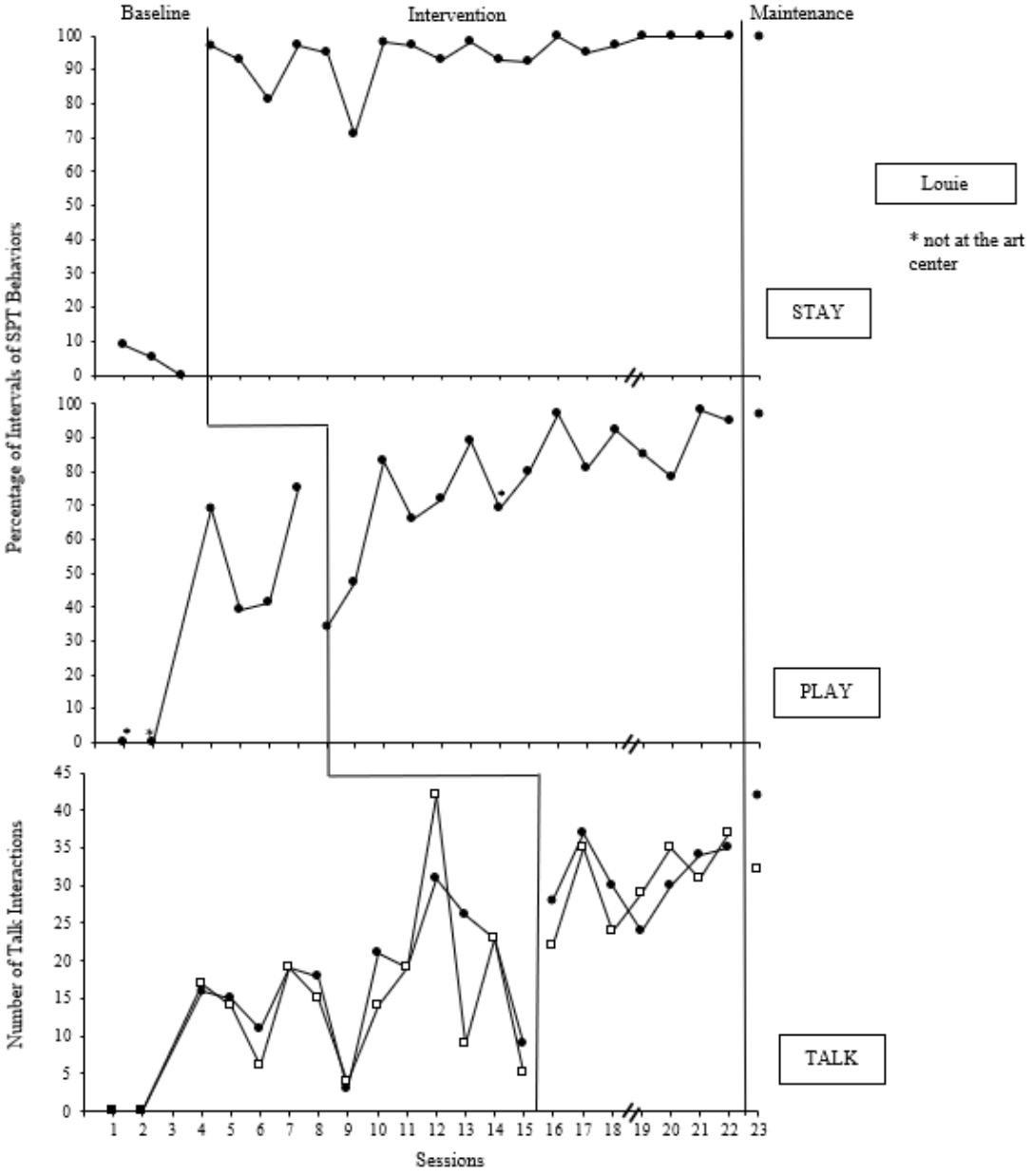

Figure 4. Stay-Play-Talk behavior results- Louie. Closed circles represent percentage of intervals of SPT behaviors during intervention sessions. Open squares represent number of talk interactions of peer. Asterisk represent sessions when Louie is not in the art center.

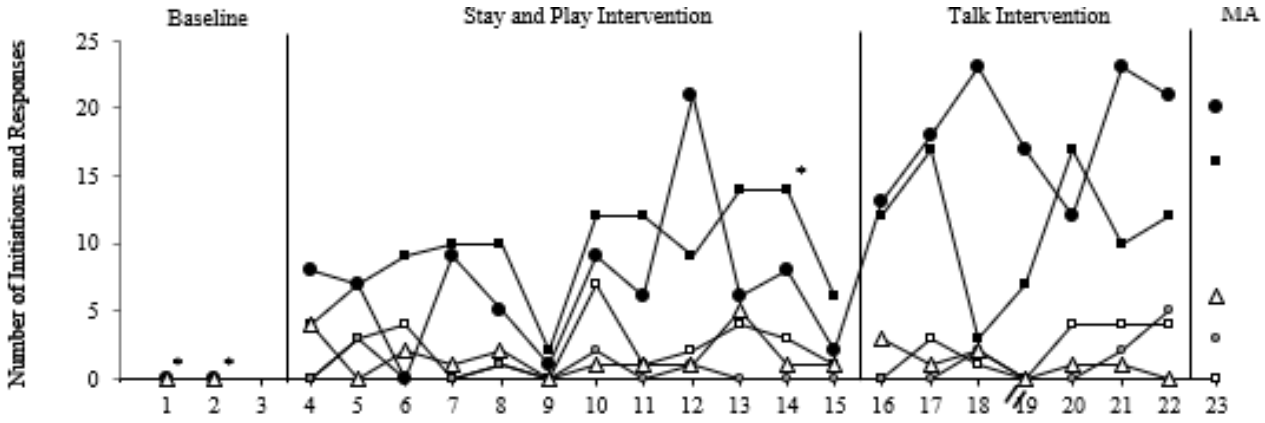

Figure 5 . Number of Initiations, Responses and Narrative Play[TLLV12]-Louie. Open squares represent number of gesture initiations. Closed squares represent number of verbal initiations. Open circles represent gesture responses. Closed circles represent verbal responses. Open triangles represent narrative play responses.

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APPENDIX A

TEACHER FORM FOR TARGET PARTICIPANTS

Name:_____ Job Title: _____ Date: _____

Child's Name: _____
Child's Birthdate:_____

For the following questions, please circle YES or NO

1. Child has demonstrated the ability to engage in pretend play for at least 5 minutes. YES NO

   If YES, indicate how often the child engages in pretend play during free play:

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

2. Child regular attendance in school, with no more than 6 absences within 30 days and able to devote 10 to 15 minutes to free play period without interruption (e.g., appointments scheduled with other service providers). YES NO

3. Can the child move around the classroom centers and manipulate objects independently?

   YES NO

4. Can the child respond to questions with at least one intelligible word? YES NO

   If NO, can he indicate with appropriate gestures or signs? YES NO

5. How often does this child interact with his peers in free play?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

6. If Often or Very Often, do they interact with their peers appropriately?

7. Is the child enrolled in any additional programs or services in or outside school (e.g., speech, OT, PT, ABA) YES NO

   If yes, please indicate: _____

APPENDIX A

TEACHER FORM FOR PEER PARTICIPANTS

Name:_____ Job Title: _____ Date: _____

Child's Name: _____
Child's Birthdate:_____

For the following questions, please circle YES or NO

1. Child has demonstrated the ability to engage in pretend play for at least 5 minutes. YES NO

   If YES, indicate how often the child engages in pretend play during free play:

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

2. Child regular attendance in school, with no more than 6 absences within 30 days and able to devote 10 to 15 minutes to free play period without interruption (e.g., appointments scheduled with other service providers). YES NO

8. Can the child move around the classroom centers and manipulate objects independently?

   YES NO

9. Can the child respond to questions with at least one intelligible word? YES NO

   If NO, can he indicate with appropriate gestures or signs? YES NO

3. How often does this child interact with his peers in free play?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

4. When playing with a peer, is the child likely to play with the same type of activities (with similar toys, with similar ways)? YES NO

APPENDIX B

TEACHER RATINGS: INDIVIDUAL DEGREE CENTRALITY

Please rate how often children in your class play and interact with other children, on average. It doesn't matter which child initiates the interactions, as long as they are positive or neutral. Do not include problematic interactions (e.g., conflict, aggression).

Playing and interacting may look different for some children. **Playing** might include engaging in pretend play with a peer but also might include engaging in repetitive or sensory play with other children. Do not include isolate play. **Interacting** includes talking to peers but may also include, for example, using gestures to initiate a chase game on the playground or using a voice-generating device (AAC) to make a comment but does not include problematic interactions.

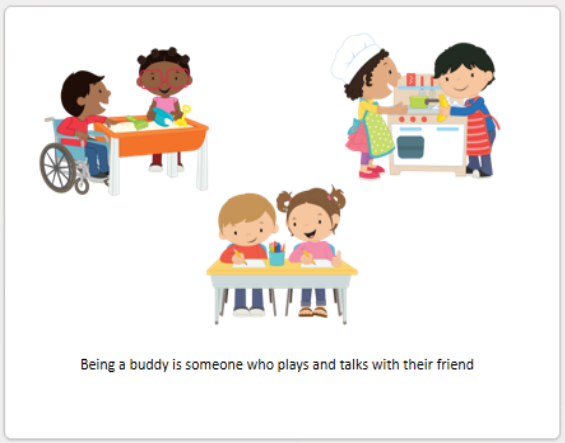
Please use the following codes:
0: These two children **never** play or interact (e.g., haven't observed children playing together)
1: These two children **rarely** play or interact (e.g., less frequently than once per week)
2: These two children **sometimes** play or interact (e.g., play together at least weekly)
3: These two children **often** play or interact (e.g., play together most days)
4: These two children **always** play or interact (e.g., play together every day)

	TC 2	LT 3	LT 5	LT 7	LT 1	TC 1	LT 6	LT 8	LT 4	LT 3	LT 9
TC 2		2	3	2	2	0	3	2	3	3	3
LT 3			2	4	3	0	2	3	4	3	3
LT 5				4	4	0	2	2	2	2	4
LT 7					4	0	3	2	4	4	4
LT 1						0	3	2	4	3	4
TC 1							0	0	0	1	0
LT 6								1	4	4	3
LT 8									2	2	2
LT 4										4	4
LT 3											4
LT 9											

APPENDIX C

SPT BUDDYTIME GUIDEBOOK EXAMPLE

1



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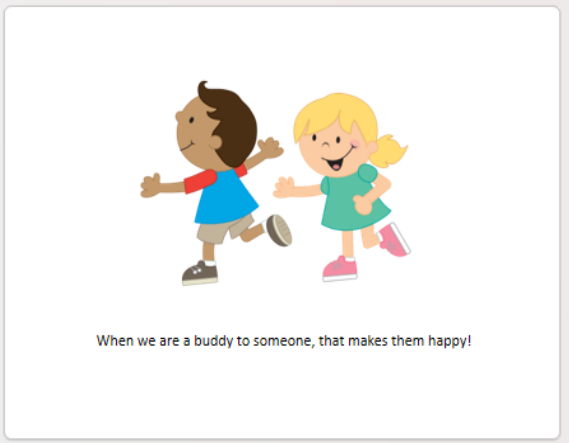

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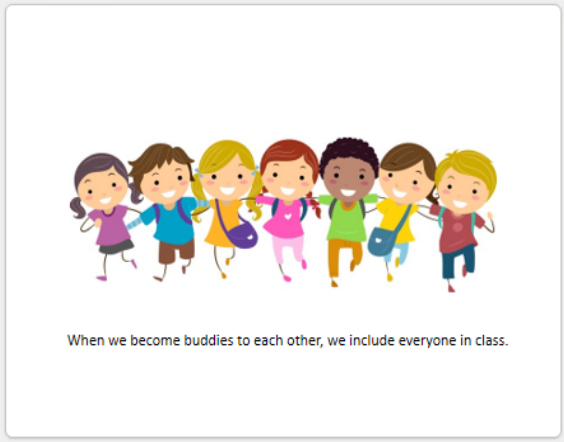

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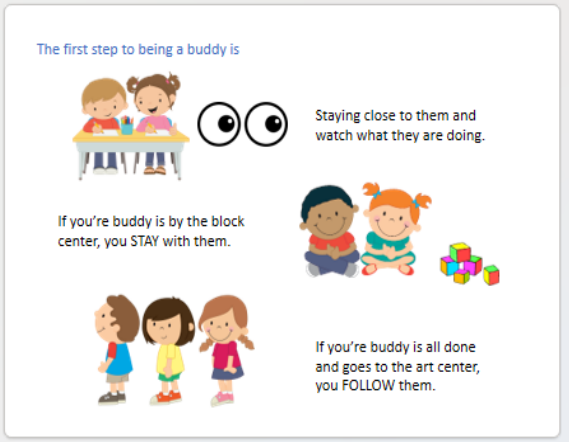
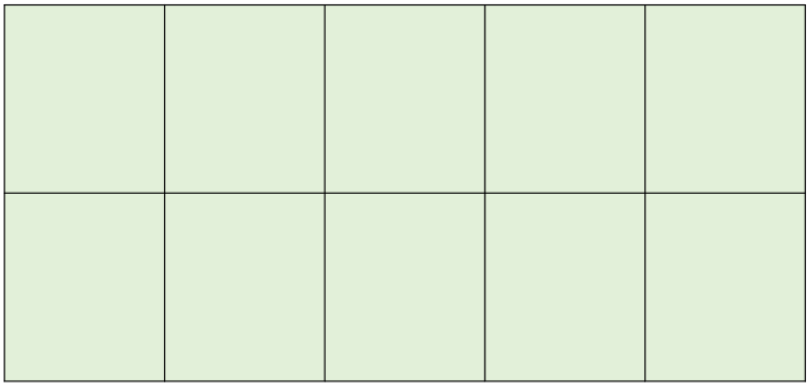


6

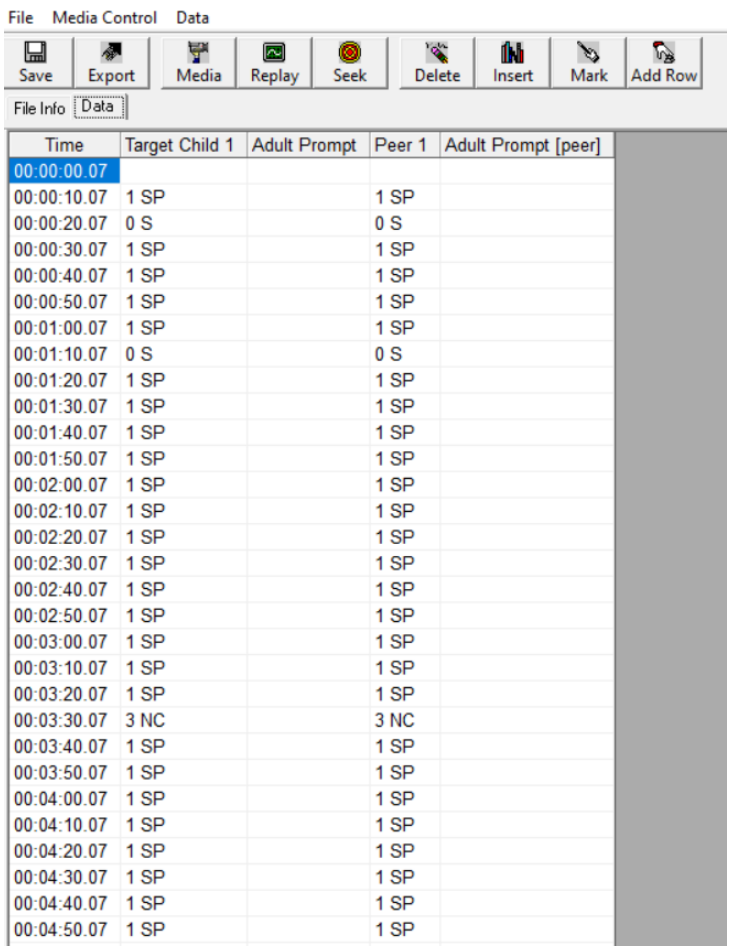
APPENDIX D

TOKEN BOARD AND TOKENS



APPENDIX E

SAMPLE PROCODER DATA SHEETS FOR STAY, PLAY AND TALK


File Media Control Data

Save Export Media Replay Seek Delete Insert Mark Add Row

File Info Data

Time	Target Child 1	Adult Prompt	Peer 1	Adult Prompt [peer]
00:00:00.07				
00:00:10.07	1 SP		1 SP	
00:00:20.07	0 S		0 S	
00:00:30.07	1 SP		1 SP	
00:00:40.07	1 SP		1 SP	
00:00:50.07	1 SP		1 SP	
00:01:00.07	1 SP		1 SP	
00:01:10.07	0 S		0 S	
00:01:20.07	1 SP		1 SP	
00:01:30.07	1 SP		1 SP	
00:01:40.07	1 SP		1 SP	
00:01:50.07	1 SP		1 SP	
00:02:00.07	1 SP		1 SP	
00:02:10.07	1 SP		1 SP	
00:02:20.07	1 SP		1 SP	
00:02:30.07	1 SP		1 SP	
00:02:40.07	1 SP		1 SP	
00:02:50.07	1 SP		1 SP	
00:03:00.07	1 SP		1 SP	
00:03:10.07	1 SP		1 SP	
00:03:20.07	1 SP		1 SP	
00:03:30.07	3 NC		3 NC	
00:03:40.07	1 SP		1 SP	
00:03:50.07	1 SP		1 SP	
00:04:00.07	1 SP		1 SP	
00:04:10.07	1 SP		1 SP	
00:04:20.07	1 SP		1 SP	
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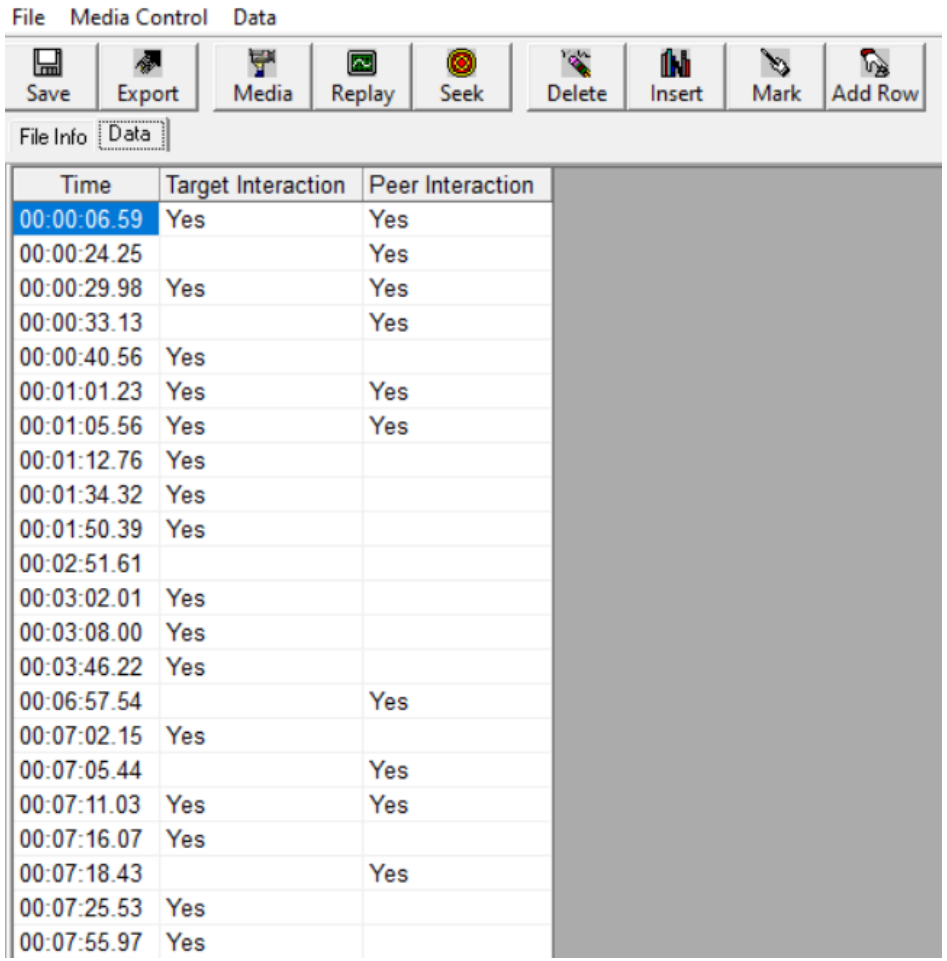
00:04:40.07	1 SP		1 SP	
00:04:50.07	1 SP		1 SP	


File Media Control Data

Save Export Media Replay Seek Delete Insert Mark Add Row

File Info Data

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00:00:29.98	Yes	Yes
00:00:33.13		Yes
00:00:40.56	Yes	
00:01:01.23	Yes	Yes
00:01:05.56	Yes	Yes
00:01:12.76	Yes	
00:01:34.32	Yes	
00:01:50.39	Yes	
00:02:51.61		
00:03:02.01	Yes	
00:03:08.00	Yes	
00:03:46.22	Yes	
00:06:57.54		Yes
00:07:02.15	Yes	
00:07:05.44		Yes
00:07:11.03	Yes	Yes
00:07:16.07	Yes	
00:07:18.43		Yes
00:07:25.53	Yes	
00:07:55.97	Yes	

APPENDIX F

PROBE DATA COLLECTION SHEET

Observer: _____ Time: _____ Date: _____

Setting: _____ Target Child: _____ Peer Name: _____

	Reinforcer	Peer says Target Child's name	Target child looks at peer within 5 s	Peer offers reinforcer to target child	Target child accepts reinforcer from child
Trial 1					
Trial 2					

	Toy	Peer says Target Child's name	Peer shows toy to target child	Target Child looks at the toy within 5 s	Target child looks at the peer within 5 s
Trial 3					
Trial 4					

APPENDIX G

STAY-PLAY-TALK VISUAL CUE CARDS

STAY

PLAY

TALK

APPENDIX H

SPT TRAINING PROTOCOLS ADAPTED FROM SEVERINI (2019) and MILAM (2021)

WHOLE GROUP SPT TRAINING SESSION 1: STAY

Introduction	
Discuss the importance of playing with friends	• Read the scripted picture guide and discuss. • "I am going to teach you how to play with your friends who may be a little shy and it is called being a buddy!" • Introduction to buddy time • "A buddy is someone who plays and talks with their friends. When we are a buddy to someone, that makes them happy. When we become buddies to each other, we include everyone in our class. Since we all like to play and talk to our friends, being a buddy to someone means you are really doing your best to be friends with someone and making them happy!"
Introduce STAY using the visual	• Introduce the STAY visual • All the children repeat skill aloud • Explain what the visual looks like
Describe what it means to STAY	• "The first step to being a buddy is staying close to them and watch what they are doing. If your buddy is at the art center, you stay with them at the art center. If they want to move to play with blocks, you follow them to the blocks center!" • "If we are too far away from our buddy, it is hard to play and talk with them" • "It is important to stay with your buddy the whole time during buddy time"
Examples of STAY (Make sure to practice these)	• If your buddy sits at the art table or playing a game at the table, you should sit next to them at the table. If your friends gets up to leave the table, you should get up and follow them. • If your buddy is playing on the carpet, you should sit next to your partner on the carpet. When you friend gets up to leave, you leave the carpet too. • If your buddy is in the dramatic play center, you should stand beside your buddy 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. • If your friend wants to go potty, you can follow them to the potty door and wait for them until they come back out.
Practice	
Modeling of STAY	• The researcher will be the peer, the teacher will be the target child • The teacher will be asked to act shy and move around the classroom • "If X goes to the carpet, what should I do? I am going to follow her to the carpet!", "Now, what if she moves to the table right after? What do I do? I move to the table". • Engage children by asking questions (e.g., "did I stay?")
Children practice STAY in small	• "Now it's your turn to practice with each other"

groups (with feedback from trainers)	• Sort children into small groups and assign target children and peer buddy to the group led by the teacher • Direct one child to be the buddy and one child to be the buddy who is shy to play. • Provide prompts as needed to child to get them to move around the room and to the buddy if s/he does not follow • Provide descriptive praise for staying with their buddies
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 the visual
Provide reinforcement	• "Thank you so much friends for being such good buddies to one another today. For listening and following carefully, you can get a sticker!" • Provide all participating students with a reinforcement before dismissing

WHOLE GROUP SPT TRAINING SESSION 2: PLAY

Introduction	
Discuss the importance of playing with friends	• Read the scripted picture guide and discuss. • "I am going to teach you how to play with your friends who may be a little shy and it is called being a buddy!" • Introduction to buddy time • We want to make sure no one in our 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 friends, you stay close to them even if they move to a new place. So if they move to another center, we go with them! If we are too far away, it is hard to play or talk to our friends. • Today, we are going to learn what we do when we are staying with our friends/buddies: we PLAY with our friends!
Introduce PLAY using the visual	• Introduce the PLAY visual • Let the children repeat the skill • Explain what the visual looks like, if needed
Describe what it means to PLAY	• To make our buddy feel happy, we play with them! • When we stay with our friends, we play with them too. • You can play with your friend by doing the same thing they are doing or play with the same toy they are playing. • You can also take turns playing with the toy or make something together. • Some things you can do to play with your buddy are taking turns playing a game, building a tower together, drawing or painting an art work together or playing together in the dramatic play! • During buddy time, it is very important that you play with your buddy.
Examples of PLAY (Make sure to practice these)	• Making something in the kitchen or cooking and washing dishes at the dramatic play center. • Building block towers or structures together (or similar structures next to each other) • Making a train track together and then play with it.

	• Playing cars/ people/ dinosaurs (other small manipulatives) and doing the same actions as your buddy • Play a game or make a puzzle together • Create an artwork or play-dough structures together (or similar and close proximity to each other if they are working separately) • Clean up a toy or game with a friend
Practice	
Modeling of PLAY	• The researcher will be the peer, the teacher will be the target child • The teacher will be asked to act shy, but choose something to play. • "If X chooses to build blocks, what should I do? I am going to follow her to the construction zone and build blocks too!", "Now, what if she starts to play with the cars? What do I do? I also play with cars". • Engage children by asking questions (e.g., "did I play with my buddy?")
Children practice PLAY in small groups (with feedback from trainers)	• "Now it's your turn to practice with each other" • Sort children into small groups and assign target children and peer buddy to the group led by the teacher • Direct one child to be the buddy and one child to be the buddy who is shy to play. • Provide prompts as needed to child to get them to move around the room and to the buddy if s/he does not follow or play with the buddy. • Provide descriptive praise for playing with their buddies
Conclusion	
Review of PLAY, using the visual	• "Remember, PLAY means to play with your buddy by doing the same thing they are doing or playing the same toy they are play with" • Refer to the visual
Provide reinforcement	• "Thank you so much friends for being such good buddies to one another today. For listening and following carefully, you can get a sticker!" • Provide all participating students with a reinforcement before dismissing

WHOLE GROUP SPT TRAINING SESSION 3: TALK

Introduction	
Discuss the importance of playing with friends	• Read the scripted picture guide and discuss. • "We are going to continue playing with our friends who may be a little shy!" • During buddy time, we stay with our buddies, so they have someone to play with and they are not alone. • "When we play with our buddy, we make them happy!"
Review STAY and PLAY	• Show children the STAY and PLAY visuals. • Remember, last time we talked about and practiced staying and playing with your friend. • When you STAY with your friends, what do you do? **(Give opportunity to answer)**. You stay close to them even if they move to a new place. If they move to another center, we go with them! If we are too far away, it is hard to play or talk to our friends. • When we PLAY with your friends, what do you do? **(Give opportunity to answer).** You do the same thing your buddy is doing! That means if they are playing with a toy, you also play with the toy. If they are making a tower with blocks, you help them build it!

	• Today, we are going to TALK to our friends when we are playing with them!
Introduce TALK using the visual	• Introduce the visual • All the children repeat skill aloud • Explain what the visual looks like
Describe what it means to TALK	• "When you stay and play with your friend, you should also talk with them. Sometimes our friends can be shy to talk to you, but by talking to them, they will feel happy!" • "You can talk to your friend in two ways: you can **LEAD** or **INITIATE** or you can **REPLY** or **RESPOND**". The researcher displays two visuals of initiating and responding. Researcher can explain the picture. **Initiations:** • When you lead, you ask your buddy a question or tell them something cool. You can ask them to play with you like "Hey, do you want to play with the cars?" or "Ms. X, do you want to color this page with me?". • You can also show them something cool like "Look, I made this tower!" or "Look at my artwork". • You can also LEAD or INITIATE by saying something nice about your buddy or what they are doing like "Wow! I like your shirt today!" or "Your car went super fast!" or even just "Good job!" or a high-five! • Sometimes when we initiate, we can also tap their shoulder or point to an object. For example, if I want to tell Ms. X something, I can tap her by the shoulder and point to a toy or give her a toy. • We can also LEAD by greeting our friends by saying "Hi, ___!" or waving to them. • What are other examples you can think of? (e.g., sharing, talking about your weekend, giving compliments or praises) **Responses:** • The second way of talking to our friend is REPLYING or RESPONDING. When we reply to a friend, we are answering a question or doing something our buddy asked us to do. For example: When Ms. X asks me a question, I can answer something "Oh, I am drawing a house" or "I am playing with the dolls". When Ms. X asks me to play, I can go and play with her. • When our buddy asks us something, we can respond with saying "Yes!" or "No" or "Maybe". We can also say nod our head to agree, shake our head if we want to say no. • When our buddy gives us a high-five, we can RESPOND by giving him a high-five back. • What are other examples you can think of? (e.g., taking a toy from buddy when it is offered, suggesting what to play, saying thank you).
Examples of TALK (Make sure to practice these)	**Initiations:** • Greeting your buddy (verbal and gesture) • Saying their name • Commenting positively on friend's creations or actions • Asking your buddy to come play (verbal and gesture) • Asking to join other friends in what they are playing • Making suggestions on what to play • Giving praises to our friends

	• Asking for a toy (verbal and gesture) **Responses:** • Answering a question • Following a friend's suggestion to play • Saying yes, no, maybe (verbal and gesture) • Taking an offered toy from a friend • Giving a high-five back to a friend
Practice	
Modeling of TALK	• The researcher will be the peer, the teacher will be the target child. The teacher will be asked to act shy. • The researcher will ask teacher to pick a play activity and model different ways to talk to friends (use previous examples) • The researcher can also ask the teacher to model giving initiations and responses as the target child (e.g., pointing, gesturing, saying what they want to play, asking for a turn).
Children practice TALK in small groups (with feedback from trainers)	• "Now it's your turn to practice with each other" • Sort children into small groups and assign target children and peer buddy to the group led by the teacher • Direct one child to be the buddy and one child to be the buddy who is shy to play. • Provide prompts as needed to child to get them to move around the room and to the buddy if s/he does not follow • Provide descriptive praise for staying with their buddies
Conclusion	
Review of TALK, using the visual	• "Remember, TALK means to ask your friend a question, tell them something using our words or actions" • Refer to the visual
Provide reinforcement	• "Thank you so much friends for being such good buddies to one another today. For listening and following carefully, you can get a sticker!" • Provide all participating students with a reinforcement before dismissing

APPENDIX I

SPT CODING PROTOCOL

When to code STAY

CODE STAY when target child or peer is within a 3-foot radius of their assigned partner (a) in the same classroom center as the target child (e.g., construction zone, art center) or (b) oriented towards the same direction as the peer.

Examples:

- Target child standing, sitting, or lying beside their peer
- Either a target child or peer's arm/foot within 3 feet of the other's space.
- If they are both transitioning to another center together

DO NOT CODE stay if either target child or peer:

CODE NONE IF:

- Peer is being prompted by the teacher and she has not yet joined her buddy
- Target child and peer being more 3 feet apart from one another
- Target child and peer are in a different spaces or centers even if they are 3-ft apart.
- If there is another child in between the target child and peer
- The peer is in one center and the target child is leaning over a shelf (into another center) or standing outside the center area.
- Target child or peer have both feet/arms outside of their partner's space and vice versa.
- the camera should always have the Target child included, so if the peer is not within the frame, you will code NO BEHAVIORS. This means they are far away from each other.

Not codable:

- If a target child or peer are off camera within the 3 feet of each other, it will not be coded (e.g., camera turns the other way not capturing the peer or target child due to videographer movement).
- When a teacher or center is blocking the view of the TC or Peer that cannot make us tell if they are staying together.

Exceptions

1. When the peer or target child leave to get a certain material but returns within the end of the next interval, **CODE AS STAY.**
2. **For TC 1,** if peer and TC 1 is in the same center:
    a. **CODE STAY:** if they are oriented towards one another, even if 3ft apart.
    b. **DO NOT CODE STAY:** if they have their backs turned and facing in opposite directions.

When to code PLAY[TLLV13][TLLV14][TLLV15]

CODE PLAY when both participants (a) appropriately manipulating the same or similar materials as their partner (e.g., toys and materials found in the same center that are functionally similar), (b) target child or peer playing with a functionally different toy or

material, but in the same or similar manner as the peer (e.g., art or book), or (c) target child and peer sharing, exchanging or cleaning up toys or activities, (d) target child or peer holding onto similar toys or materials within a center while looking at their partner's play, (e) when participant is displaying a clear reach of materials or toys or (f) if attention is on the adult giving them a prompt or reinforcement. Code both cooperative play and parallel play instances.

Examples:

- Participants are getting materials
- Target child handing peer a block to share
- Target child and peer building a rocket ship together
- Peer stirring a boat and target child driving a car
- Target child coloring paper using markers and peer painting paper using a brush on the same artwork
- Peer coloring a house and target child is cutting paper while looking at each other's work
- Target child mixing in a bowl and peer placing food on a plate
- Target child and peer taking a picture-walk with the same book
- Target child and peer reading two separate books
- Target child and peer gathering or cleaning materials/toys
- Target child and peer playing trucks side by side
- Target child and peer drawing houses on their own papers
- Target child holding a car while watching his peer roll a car in front of him (Child can't be scored for this for more than 3 times in a row, or else it becomes not play)
- Target child is reaching out for a sea animal figurine to play with
- Peer and target child are engaged in the activity or at the teacher while they are being given a prompt.

DO NOT CODE play if either target child or peer is (a) playing or engaging in two different activities (e.g., one is playing with magna-tiles, the other is building puzzles in the same area), (b) exhibiting challenging and harmful behaviors with their partner throughout their play (e.g., grabbing and shouting), (c) child is only engaging in watching the peer interact or manipulate with the toy for more than 4 intervals, (d) either child is playing or interacting with another non-partner participant or adult and (e) if the target child or peer are off camera or if their hands manipulating the objects are not visible during play (e.g., back of participant covering view of play or camera is facing another way).

Non-examples:

- Target child building a block tower while peer plays with cars in the same area
- Participants are playing two different types of games (e.g., one is playing go fish, the other is playing wooden puzzles)
- Participants throwing or grabbing toys from each other (if such behavior is the only interaction occurring, but can occur WITHIN an example of play)
- Target child or peer is playing with another non-dyad participant

- Peer is drawing together with an adult

Not Codable:

- if the target child or peer are off camera or if their hands manipulating the objects are not visible during play (e.g., back of participant covering view of play or camera is facing another way).

Exceptions:

1. When the dyad is playing with different materials but have agreed prior that they are going to use them collectively together (e.g., one is lining up cars, the other is building a house because they are making a garage; one is cutting paper and one is painting to make a single collage). This is counted as cooperative play.

2. When the dyad is engaging in shared book reading:
   - **CODE AS PLAY** when one of them is manipulating the book, while the other watches and listens.
   - **DO NOT CODE PLAY** when one of them is manipulating the book, the other is not engaging (watching, listening or facing the other) to their partner.
3. When Target child is watching his peer play:[TLLV16][TLLV17][TLLV18][TLLV19][TLLV20]
   - **CODE PLAY** when child is watching his peer, with or without holding a toy, without manipulation, for a maximum of 3 intervals.
   - **DO NOT CODE PLAY** if child still engages in just watching for the 4th interval
4. When a child is reaching out for a toy at the end of the interval:
   - **CODE PLAY** if his intention is to grab hold of the toy
5. If the implementer is giving them a prompt or reinforcement:
   - **CODE PLAY** if the video stops while they are focused on the teacher or the act of the star being given.

When to code TALK

Talk interactions

Definition: a verbal or non-verbal engagement with a peer buddy with the intention to communicate and receive or provide a reciprocal action.

Examples:

- Clear initiations to interact
  - saying hey
  - calling their name
  - greeting them (e.g., “hi!”, “hello!”)
  - contributing an idea to the play (e.g., “let’s get the train tracks”; “the chips should be in the middle”)
  - assigning a role to their peer (e.g., “you do the animals and I’ll do the trains”)
  - Suggesting a new play scheme (e.g., “let’s go to the art center”; “we should make towers instead”)

        - Inviting a friend to come play or do something together (e.g., “Can I play with you?”; “Let’s play together”; “let’s do the boats!”)
        - Requesting for help, or a toy, or inquiry (e.g., “Can you help me?”; “Can I have a turn with the bus?”; “Can you not take the sand, please?”)
        - Asking a question (e.g., “What are you doing with that?”; “What are you drawing?”; Are you sure you want to make it that tall?”)
        - Giving a compliment (e.g., “I like your shoes”; “I like you hair”)
        - Reaching out as a gesture to share a toy with a peer
        - Tapping the peer’s shoulder to get their attention
        - Waving hello to greet the peer
    - Clear responses to interact
        - Answering a question that was posed (e.g., “I am making a tower”; “I don’t think so”; “yeah, I want to make it tall”)
        - Providing acknowledgements by saying “yes”, “no”, “maybe”, “I don’t know”, “yeah”, “thank you” or “no, thank you”.
        - Sustaining on going conversations (e.g., there is an on-going back and forth conversation**, every reply will be counted as an instance regardless of time**)
    - Narrative Play (only in cooperative play)
        - Talking about one’s play as they are playing within the same schema.
            - For instance, they both have to be doing art, even if on separate papers, and talking about their art. (art is an exception, playdough is an exception)
            - They have to be both playing boats and talking about their play with boats.
            - If they are in the sensory table, they HAVE to be playing with one another (cooperative and not just parallel).
        - Talking about what they are going to do with the materials they are both playing with. For instance, they are playing with sand and the child says “I’m gonna put sand in this”.
        - Singing and chanting songs together
        - If they are counting the toys, only code when there is a 5-second gap in between one numeral to another.

Non-examples

- Do not code if only one word out of the whole sentence is clearly audible.
- Do not code if they are talking, mumbling or singing to themselves about their play
- Do not code talk if they are communicating with another classmate who is not her partner or teacher
    - If not sure, DO NOT CODE.
- Do not code talk if they are singing, humming or chanting to themselves or at the mic
- Do not code talk if they are not staying **or** playing
- Do not code if they are narrating their play but engaging in a completely different play scheme or clearly playing alone.

    - For instance, both participants are playing in the sand table but are in parallel play. They are not playing **the same or similar scheme** (e.g., one is hiding the fish in the sand, the other is building sand castles). One says "I'm going to make a tower", this is not an interaction because they are not playing under the same schema.
    - For instance, both are playing with magnatiles but creating their own structures. Peer says "mine is tall". Without a secondary indicator, do not code.
- Repeatedly imitating the peer's verbal interaction more than once (only count the first instance)
- Inappropriate interactions such as grabbing, throwing, screaming, hitting, yelling and shouting.
- Incomplete initiations – do not count
- Name + incomplete initiation- counts as interactions

Only code a new interaction if there have been 3-s in between the end of one statement and the start of the next statement. If the child is continuously talking, even if she is saying different sentences, count as one if there is no 3-sec gap.

Talk categories

Initiations can be social interactions during play such as greetings, contributing ideas or changing play schemes (e.g., "let's build houses!", "I can cook the meat", "Hey! Not yet!"), providing validating comments (e.g., "I think that looks nice") and praises, verbal and non-verbal requests (e.g., pointing, tapping or providing validating gesture) for a toy or assistance; reaching out and showing peer the toy or activity; Providing physical affection such as a hug or high-five; Asking a question about current activity.

1. **Verbal Initiation**
    a. **CODE Verbal Initiation** when there is a secondary indicator that he was initiating towards peer by using a clear verbal direction or mand.
        Examples are listed below:
        - *Let's* find the ship!
        - *We* gotta keep the roof on.
        - *Look*, I found a doll!
        - I don't think *we* need that.
        - *I* can do the drinks and *you* can do the food.
        - *Hook it up!*
        - Whenever a participant assigns a role

    b. **CODE Verbal Initiation** when the child is contributing an idea or suggestion to the play or changing the play scheme (e.g., "let's build houses" or "let's go to the cooking station).
    c. **CODE Verbal Initiation** [TLLV21]if a continuous conversation is happening, but a child provides a new play scheme in his statement **3-seconds after** the last statement of his peer (e.g., during an exchange of responses, the child says "Let's play with animals instead"). If within the 3-s, it is a Verbal Response.
    d. **CODE Verbal Initiation** if the child says the peer's name and tries to complete a sentence (e.g., "XX, let's do--)

Exception:

- **DO NOT CODE VI** if the statement is not directed at the peer but a narration of what the play is without an additional second indicator**.** For example, the peer is playing with sea animals and they say "let's go swimming together" as directed from one animal to another and not looking at the partner (You will code this as NP).
- **DO NOT CODE VI** if the child is engaging in self-talk conversations as if they are narrating their own play of what they are doing without an additional indicator.
- **DO NOT CODE VI** if the child does not complete his sentence AND does not say the peer's name (e.g., "let's do th—")

****You may lose some initiations because there are no secondary indicators but we are capturing CLEAR initiations.*

e. **CODE Verbal Initiation** when the peer or target child has given a second indicator that he was initiating towards a peer by looking at their direction, looking at them or face them when they communicated the statement.

Examples:

- Gotya! *[while catching the peer's toy]*
- The fish are eating the shells, mmm yummy! *[looks at the direction of the peer]*

Exceptions:

- **DO NOT CODE AS VI** if the child gave a statement about his play but did not glance at their partner's direction, give a directional mand, or give a clear play suggestion. For example, peer says "I am making a house" but does not glance towards partner. You will code this as NP.

f. **CODE Verbal Initiation** when peer or target child has given a second indicator that he was initiating by saying statements to call one's attention such as saying their name, "hey" or "look".
    - Note that if a participant calls for attention continuously in quick succession (within 3s of the last occurrence), **VI will only be counted once**.

Examples:

- *Hey [name],* we have to connect the tracks!
- *Look!* I got the paper.
- *[name],* we have to solve this first.

g. **CODE Verbal Initiation** when peer or target child has given a second indicator that he refers to their interaction as a collaborative effort by saying "we".

Examples:

- *We* need to fix the oven.
- *We're* swimming in the ocean.

Exception:

- **DO NOT CODE VI** if statement was directed toward toys they are playing with and it is part of the narration (e.g., "we need to go to the market" as child plays with dolls travelling to the market building) without a secondary indicator of the peer being included.

h. **CODE Verbal Initiation** when a peer or target child asks a question about their play or their partner's engagements.

Examples:

- Why are you putting the car there?
- What if we color the whole thing black?
- Who said that?
- Can we do something else?
- Are you done?

2. Gesture Initiation

a. **CODE Gesture Initiation** when peer or target child engages in non-verbal requests such as pointing, tapping or providing a validating gesture (e.g., thumbs up, high-five, nodding or shaking their head) to call attention of partner.

b. **CODE Gesture Initiation** when peer or target child reaches out to show their partner a certain toy or activity (e.g., handing out a toy or showing a book they can read)

Note: Gesture Initiation and Verbal Initiation can be coded together. For example, if a child taps a friend on the shoulder and says "hey, can you play with me?", it is counted as GI and VI.

Note: Do not code Gesture Initiation and Verbal Initiation if participants are talking to non-partner peers and adults.

Note: Even if the statement of child was intended to be an initiation, not all initiations are going to be counted under Initiations if there is no clear secondary indicator present. We are looking for CLEAR initiations.

Responses can be providing statements of acknowledgement (e.g., "yes, and then we can…"), agreement or disagreement in response to an initiation from a peer; continuing a conversational exchange of related statements; returning a high-five or accepting a hug; taking a toy from peer offering it; child sits on seat joining the invitation of peer; a statement with a secondary indicator that it is in response to peer's statement (e.g., "Let's go do the puzzles", "yeah, I want to do the bus puzzle")

1. Verbal Response

a. **CODE Verbal Response** when there is a secondary indicator that is a reaction from the peer or target child such as providing statements of acknowledgement, agreement or disagreement such as "yes", "no", "okay" or "yeah".

b. **CODE Verbal Response** when there is a secondary indicator that is a reaction from the peer or target child such as providing **related** statements in

response to partner's statement, whether in a single instance or a continuing conversation **within 3s of the last exchanged statement**.

Examples:

- peer says, "Let's go do the puzzle" (VI), 3 seconds later, target child says: "I want to do the bus puzzle" (VR) [this is a related response within the time]
- peer says, "the car is going fast" (NP), 2 seconds later, the target child says "oh no, it's gonna crash" (VR). [related response, within the time]
- target child: "I'm going to draw a new house" (VI)
  peer: "yeah, I'm going to make mine tall" (VR 1)
  target child: *3 seconds* "well, I'm going to make mine pink" (VR 2)
  peer: *6 seconds later* "Well, I made mine blue" (new instance of VI)
  [VR 1 and 2 are related responses, they are also within the time. The last statement was related but was over 5 seconds, so it is coded as VI]

i. **CODE Verbal Response** on imitations of either peer or target child's exact statements and vocalizations (e.g., mmmmm, ahhhh), appropriate to the context of what they are doing.
   - Each **repeated statement by the same child** should be **at least 3s apart** to be counted as separate instances. For example, the child says "ahhh, ahhh, ahhh" with no pauses, this gets coded as 1 VR.
   - When peer and target child **imitate each other**, the first instance is counted as a VI and **each** instance after is counted as VR, **regardless of the time.** For example, the peer says "go" (VI) and the target child say "go" within 2s (VR). The peer then says "go" within 2s (VR), and the target child says "go" again within 2s (VR).

   Examples:
   - When a figurine is falling off and they say "ahhh" after one another, only the first exchange (peer: "ahh" (VI), target child: "ahh" (VR)) one will be an initiation and the other will be a response.
   - When the target child and peer are playing with boats and the target child says "hook it up"(VI) and the peer replies "hook it up" (VR). The child says "hook it up" (VR) and the peer says "hook it up" (VR) again. The only time it may be a new initiation is when there has been at least 3-s apart.

j. **CODE Verbal Response** if the response is an imitation of the exact same statement that contains a secondary indicator or if there is an emphasis on the verb.

   Examples:
   - Peer says, "Hook it up" (VI), target child glances at peer and says "hook it up! (VR)"

- Peer says “we are going to play” (VI) and the target child replies “we *ARE* going to play” (VR), with an obvious change in intonation.

Exceptions:

- **DO NOT CODE** VR if participants are responding to peers who are not their current buddy.
- **DO NOT CODE VR** if participants are screaming or crying in response to peer initiation.

2. Gesture Response
    a. **CODE Gesture Response** if the target child or peer is returning a high-five, accepting a hug from a peer or a toy that is being given to them.
    b. **CODE Gesture Response** if the target child or peer sits on a seat or gets down on the mat following an invitation from their partner to join. For example, peer says “hey, let’s make some tracks” and the target child kneels down on the mat and joins in making a track.

Exceptions:

- **DO NOT CODE GR** if participants are grabbing toys from their partner’s grasp or inappropriately taking objects from them. Grabbing is when the child takes the toy or item without peer consent.

Narrative Play can be descriptive narrative statements about one’s current play or what they want to do; Self-talk conversations or vocalizations about their play; vocalizing sound effects related to current play (e.g., target child says “vroom, vroom” when rolling a car); Both target child and peer are describing what they are doing without any secondary indicator of it being directed to one another (e.g., peer says “the car is going fast, ahhh” and the target child says “the tracks are wet” with no glances)

a. CODE Narrative Play when the target child or the peer engages in narrative statement’s about one’s current play or what they want to do such as self-talk conversations or vocalizations as they are manipulating items (without eye-gaze or secondary indicators).

Examples:

- Target Child says “Vroom Vroom” as he is rolling a car
- Peer says “The pirates are yelling from the top, ahhhh!!”
- Target child says “We are gonna lose, help me! I’m gonna fall down” but not looking at the peer for a response.
- Peer says “Ahh! I’m about to crash” while looking at only the car

Exceptions:

- **DO NOT CODE Narrative Play** when participant says sound effects that are not appropriate for their current play. For example, if they say “hmmm” or “ahhh” while stacking blocks without any secondary indicators of what their play is.
- If the child verbalizing a sound effect appropriate to play, **count as NP** on the first **three** instances of sound, with **at least 3s in between** each instance (e.g., 3 NP=“ ahh”--3s--“ahh”--4s--“ahh”). If the child says the sound more than those 3 instances within 3s,

code as 1 NP (e.g., 2 NP= "ahh" --2s--"ahh"--3s--"ahh"). You will code the next instance once 3s has passed.

- Singing and chanting will be counted as 1 instance from the onset of the vocalization.

Note: Coding statements as narrative play, followed by a clear response, is acceptable. Do not change to initiation unless there is a clear second indicator that there is one.
Note: There will be a tendency to code certain initiations as narrative play because there is no secondary indicator that makes it a clear initiation. Look out for eye-gaze of participants and if they are directing statements to their partner through facial orientation.
Note: You have to MARK timestamp on Procoder at the END of the statement. When counting latency (seconds) to following statement, use the ending timestamp of the last statement to the onset of the new statement.

APPENDIX J

TRAINING FIDELITY SHEETS

Whole group BST (STAY)		
Steps	Yes	No
1. Read scripted guide and introduced buddy time		
2. Introduce STAY visual and explain		
3. Describe what STAY means with examples		
4. Model STAY examples with teacher		
5. Sort children into groups and assign TCs to teacher		
6. Practice STAY and provide feedback		
7. Review STAY visual		
8. Provide reinforcement		
TOTAL (percentage)		

APPENDIX J

TRAINING FIDELITY SHEETS

Whole group BST (PLAY)		
Steps	Yes	No
1. Read scripted guide and review buddy time		
2. Review STAY		
3. Introduce PLAY using the visual		
4. Describe what PLAY means with examples		
5. Model PLAY examples with teacher		
6. Sort children into groups and assign TCs to teacher		
7. Practice PLAY and provide feedback		
8. Review PLAY with visual referral		
9. Provide reinforcement		
TOTAL (percentage)		

APPENDIX J

PROCEDURAL FIDELITY SHEETS

Whole group BST (TALK)		
Steps	Yes	No
1. Read scripted guide and review buddy time		
2. Review STAY and PLAY		
3. Introduce TALK using visuals		
4. Describe what is means to TALK and give examples		
5. Model TALK examples with teacher		
6. Sort children into groups and assign TCs to teacher		
7. Practice TALK and provide feedback		
8. Review TALK with visual referral		
9. Provide reinforcement		
TOTAL (percentage)		

APPENDIX K

SOCIAL VALIDITY CHART

Instructions: *Record "YES" in the column participants prefer to play in.*

Participant	Buddy Time	Free Play Time
TC 1		YES
TC 2	YES	
LT 1		YES
LT 2	YES	
LT 3	YES	
LT 4		YES
LT 5		YES
LT 6	YES	
LT 7	YES	
LT 8	YES	
LT 9	YES	
TOTAL	7/11 (63%)	4/11 (36%)