Implementing Stay, Play, Talk with Children who use AAC

By

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CHAPTER I

INTRODUCTION

Social relationships are integral to the lives of people with and without disabilities (Lindsey, 2002; Therrien, Light, & Pope, 2016; Vaughn, Colvin, Azria, Caya, & Kryzsik, 2001). To form and sustain social relationships, adequate social communication is required. In early childhood classrooms, high quality peer social interactions are particularly important; they lead to social inclusion, more meaningful friendships, higher self-esteem, and a high quality learning context (Hemmeter, Ostrosky, & Fox, 2006). For children with disabilities, positive social interactions with typically-developing peers are critical for providing a context for communication with a competent language partner and more meaningful inclusion in the classroom. However, children with disabilities usually interact with peers at a lower rate compared to typically-developing children (Honig & McCarron, 1988)). Moreover, children with complex communication needs and who use augmentative and alternative communication (AAC) devices are at a particularly greater risk for social isolation and rejection from their peers (Clarke & Kirton, 2003; Therrien et al., 2016).

Inclusive early childhood environments provide an avenue for these important social interactions between typically-developing children and children with disabilities. Although they have the potential to increase social interactions between children with disabilities and their peers, inclusive environments are not sufficient to create an adequate number of opportunities for positive interactions (Robertson, Green, Alper, Schloss, & Kohler, 2003). In inclusive environments, typically-developing children tend to primarily interact with their typically-developing classmates when left to their own devices (Goldstein, 1997). Thus, to improve rates of interactions between children with and without disabilities, adults may need to provide prompting and reinforcement. It may be particularly important to provide these supports to typically-developing peers because of the increased risk of social isolation associated with having a disability.

Stay-Play-Talk (SPT), a peer-mediated intervention, is an established procedure designed to increase the social interactions of children with and without disabilities in inclusive preschool classrooms (Goldstein, Kaczmarek, Pennington, & Shafer, 1992). In this intervention, typically-developing peers are taught specific strategies regarding how to stay, play, and talk with their peers with disabilities. During free play, teachers typically prompt the peers to engage in SPT behaviors, and provide reinforcement contingent on staying, playing, and talking with their peers with disabilities.

Previous research has shown that SPT interventions have been generally successful in increasing social interactions between children with disabilities and their peers. Goldstein et al.'s (1992) original SPT intervention increased rates of social interaction between typically-developing children and children with disabilities. Generally SPT interventions have occurred in free play contexts, but Goldstein and English (1997) and English, Goldstein, Kaczmarek, and Shafer (1997) implemented SPT interventions across the school day (e.g., snack, free play, small groups), to encourage response generalization across contexts. Additional research on SPT

interventions has shown they are also effective in increasing the number, length, and reciprocity of social interactions between typically-developing children and children with disabilities (Kohler, Greteman, Rasche, & Highnam, 2007; Hughett, Kohler, Raschke, 2013). In a recent study, Thiemann-Bourque, Brady, McGruff, Stump, and Naylor (2016) investigated the effectiveness of a peer-mediated intervention using the Picture Exchange Communication System (PECS), a low-tech AAC system, on the spontaneous communication and engagement of children with autism. They trained peers to engage in a series of responsive social skills adapted from the original SPT modified to incorporate PECS training, and found therapeutic level changes in children's communication and engagement. However, the extent to which they controlled for threats to internal validity is unclear, which limits interpretations of their results.

To date, however, SPT interventions have not explicitly included a high-tech AAC training component or participants who use high-tech AAC devices. This may be problematic because many children with disabilities have communication impairments, and the use of AAC devices increases the frequency and quality of social and functional communicative acts of its users (Cosbey & Johnston, 2006; Clarke & Kirton, 2003). Children who use AAC devices are at a greater risk for social isolation because of their communication deficits in addition to their disability status (Therrien et al., 2016). Clarke and Kirton (2003) investigated the communicative interactions between children who use high-tech AAC devices and their typically-developing peers. They found that children who use AAC devices took fewer communicative turns, made fewer initiations, and generally used more nonverbal gestures than AAC activations (e.g., the child would use a head-nod rather than pressing yes on the AAC device; Clarke & Kirton, 2003). Though their investigation indicated that these dyads could benefit from a peer-mediated intervention, this study was observational in nature (no intervention was assessed).

Many studies that explicitly include a high-tech AAC teaching and modeling component focus on the children's functional, rather than social, communication. For example, Cosbey and Johnston (2006) found that teaching the use of a single-switch voice output communication aid increased the frequency of requests of children with severe disabilities. Likewise, Bock, Stoner, Beck, Hanley, and Prochnow (2005) investigated whether PECS or voice-output systems lead to a greater number of requests in children with communication deficits. The dependent variables in these studies were specifically the number of request statements, rather than social communicative statements. Though these interventions are important for promoting functional communication, they lack the social communicative aspect that is important for supporting social interactions and friendships in an inclusive setting.

Further quality research on the training of the social use of additional AAC systems with peers is needed; it has the potential to increase peer's use of and competence with the device, which may lead to improved social interaction opportunities (Clarke & Kirton, 2003). Moreover, when peers model appropriate AAC usage during play, the number of social communicative behaviors of children with autism who use AAC devices increased (Trembath, Balandin, Togher, & Stancliffe, 2009).

This study extends current research on typical SPT interventions by investigating whether SPT is effective for teaching typically-developing children to stay, play, and talk with a child who uses a high-tech AAC device. The research questions were: When compared with a baseline condition, will SPT with an AAC training component: (a) Increase the percentage of intervals in which a child with a disability and his/her peers stayed near each other, played with similar toys, and talked to each other, and (b) increase the number of social interactions between peers and the child with disabilities?

CHAPTER II

METHODS

Participants

This study included two target children and four typically-developing peers between the ages of 36 and 72 months old. One of the peers was withdrawn due to a combination of school absences and failing to provide verbal assent for three consecutive sessions. To be considered for inclusion in the study, the target participants met the following criteria (see Appendix A for a list of inclusion criteria?): (a) engage in low levels of peer social interaction, but still responsive to peers' bids for attention (see Appendix B for probe session form); (b) have the ability to engage in pretend play; (c) answer questions with at least one intelligible word (e.g., spoken, AAC); and (d) use an augmented or alternative (AAC) device. See Table 1 for additional details on target child inclusion criteria. To be considered for inclusion in the study, the peer participants met the following inclusion criteria: (a) engage in high rates of peer social interaction; (b) engage in high rates of compliance when given directions from a teacher; (c) regularly engage in pretend play; (d) receptively understand questions from peers; (e) have the ability to answer questions with at least one intelligible word; and (f) be likely to interact with peers during free play. See Table 2 for additional details on target peer inclusion criteria.

The target participants for this study were Sammie and Timmy. Sammie was a 38-month-old Caucasian female child with Down syndrome. Sammie's teacher reported that she rarely interacted with her peers in free play, had the ability to engage in pretend play, and receptively understood questions from peers. Timmy was a 63-month-old Caucasian male with Down syndrome. Timmy's teacher reported that he interacts rarely with his peers in free play, had the ability to engage in pretend play (though did so rarely), and could receptively understand questions from peers.

The peer participants with Sammie were a 36-month-old Caucasian male, Jake, and a 38-month-old Caucasian male, Matt. The peer participant in Timmy's dyad was a 48-month old Caucasian male, Mark. The peer participants were enrolled in the same inclusive preschool as Sammie and Timmy; one peer had a diagnosed disability. The children's teachers reported that all three of the peer participants for Sammie and Timmy interacted with their peers often or very often (though did not interact with the target child), engaged in pretend play at a high rate, and had a rate high rate of compliance with teacher instructions.

Settings

This study was conducted in two classrooms in a university-based inclusive early childhood program in middle Tennessee. At study onset, Sammie's classroom consisted of 10 children between the ages of 36 and 51 months; Timmy's classroom consisted of 12 children between the ages of 46 and 64 months. Each classroom had two to three teachers: a lead teacher, an assistant teacher, and a graduate teaching assistant; staff rotated throughout the day. Some children had disabilities. The classrooms were approximately 8×9 m and included: a child-sized

table and chairs, a small gross motor area, a sensory table, a bookshelf, and toys on child-level shelves that allowed for exploration (e.g., manipulatives, props, blocks, music).

The primary researcher and a second implementer implemented all intervention sessions inside the child's classroom during a naturally-occurring or researcher-contrived free play activity. During all sessions, the children were free to play in any part of the classroom. During some of the sessions, some of the non-participating children in the classrooms were present; they followed their daily classroom routine and were able to interact with the participants at all times. For most of Timmy's sessions, the non-participating children were not in the classroom. The primary researcher conducted all training sessions in a separate room down the hall from the classroom or in the target child's classroom when non-participants were absent. The separate room was approximately 5x6 m and contained a child-sized kidney-shaped table, several child-sized chairs, and various toys (e.g., puzzles, animal agents, books).

Materials

During baseline and intervention sessions, the participants played with toys that were in their classroom. The participants were free to play with any toys that were available in any center in the classroom (e.g., puzzles, blocks, trucks, books). The intervention materials included a token board, tokens (see Appendix D), and a 1048 Traceable® Stopwatch/Repeat Timer. During training and SPT sessions, various items were offered as reinforcement that had been previously established by teachers as preferred: three choices of edibles and two tangibles.

All sessions were recorded using a Vixia mini video camera and tripod. Data collectors used ProcoderDV to collect all data for baseline and intervention sessions (Tapp, 2003).

Response Definitions and Measurement Systems

The primary dependent variables were the peers' behaviors: staying, playing, and talking with the target child. Stay was defined as being within 1.2 m of the target child and (a) in the same defined classroom center as the target child (e.g., book center, construction zone) or (b) oriented towards the target child or in the same direction as the target child. Play was defined as the peer manipulating the same or related materials as the target child. Related materials were defined as toys found within the same specified centers in the classroom that were defined by the researcher as functionally related. Talk was defined as using language to communicate with the target child either with speech, sign language, or with an AAC device. Communication with an AAC device includes pressing one or more buttons in conjunction with a second indicator to indicate communicative intent. These second indicators included: (a) joint attention gestures (e.g., point, show, give); (b) eye gaze shift in the direction of toy or peer; and (c) vocalization. See Table 3 for examples and non-examples of these SPT behaviors. Intervals were coded as stay (S), stay and play (SP), stay and talk (ST), and stay, play, talk (SPT), or none. For play or talk to be coded, the interval must also have been coded as stay. See Appendix E for specific procedures for coding talk. Research decisions were made based on the total percentage of intervals that peers were coded as staying near the child with a disability.

Data collectors collected data using fixing interval momentary time sampling to code the stay, play, and talk behaviors (Ayres & Ledford, 2014). Intervals were 5 s in duration for a total of 60 intervals for each 5-min session. At the end of each interval, the observer recorded whether or not each target peer was demonstrating each of these three behaviors, as defined above. Additionally, the sessions were coded using a count based measurement system to record the number of utterances using the same definition for talk as above. Data were collected on number of utterances from the target peer to the target child and from the target child to the target peer.

Sessions were also coded for number of social interactions, a secondary variable. Social interactions were defined as a verbal (e.g., vocalization, sign) or nonverbal (e.g., point, give) communicative interaction between the target child and target peers. See Table 4 for definitions, examples, and non-examples of social interactions. Data for social interactions were collected using a count-based measurement system; data collectors recorded the time the interaction began. Social interactions directed at the peer from the target child were coded separately from those emitted by the peer. If a verbal and nonverbal social interaction occurred simultaneously (e.g., the peer hands the target child a toy and says "here you go!"), then this was codded as two separate social interactions: one verbal and one nonverbal interaction.

After the sessions were coded using ProcoderDV, the primary researcher calculated the total percentage of intervals in which the peers engaged in S, SP, ST, or SPT behaviors per session. See Appendix F for a screenshot of ProcoderDV data for 1-min of a SPT session. See Appendix F for an example of a data summary sheet for one target peer over 6 days during the baseline and SPT conditions.

Interobserver Agreement

Reliability data were collected for at least 33% of all sessions and conditions (i.e., generally once every three sessions) using ProcoderDV (Tapp, 2003) for each participant. Before beginning data collection, the second coder was trained to criterion on the coding system. The second coder first read the operational definitions and examples/non-examples. Then, the primary researcher explained the data collection system, and the researcher and second coder watched a video of a sample session, while the researcher explained the rationale for each code. The second coder then independently scored previously-recorded practice sessions until criterion was met. The coder achieved at least 90% agreement with the primary researcher across two consecutive sessions prior to commencing study coding.

Interobserver agreement (IOA) was calculated on a point-by-point basis separately for each dependent variable and participant. An agreement was recorded if both observers record the occurrence or non-occurrence of each code (stay, play, and talk; e.g., if the primary researcher recorded "stay" for one interval, and the second observer recorded "stay play," there would be agreement for stay and talk, and disagreement for play). For count-based variables, an agreement was recorded for utterances of talk and occurrence of social interactions if both data collectors recorded the occurrence of a social interaction within 5-s of each other. IOA was calculated as follows: number of agreements divided by the sum of agreements plus disagreements, multiplied by 100 to result in a percentage of agreement ([agreements]/[agreements + disagreements] * 100) (Ayres & Gast, 2010). IOA for the primary dependent variable fell below the criterion of at least 80% for four sessions; after these occurrences, a discrepancy discussion occurred and then immediate retraining was conducted. The researcher and second coder reviewed the discrepant video together and discussed disagreements.

Average IOA data in baseline sessions across stay, play, and talk behaviors were 99% (range: 92-100%) for Sammie's group and 99% (range: 95-100%) for Timmy's group. Average IOA data in SPT sessions across all behaviors were 96% (range: 55-100%) for Sammie's group and 94.4% (range: 81-100%) for Timmy's group. Low agreement for Sammie's group was due to a discrepancy in data collector's coding regarding the functional relatedness of toys; since stay could be coded based on the participants' orientation towards functionally related toys, this discrepancy affected the stay IOA data. Average IOA data in the SPT-C sessions across all peer behaviors for Sammie's group were 96.7% (range: 86-100%). Average IOA data in the SPT-D

sessions across all peer behaviors were 96% (87-100%). See Tables 5 and 6 for average IOA data across all participants and conditions.

IOA data were collected for at least 33% across conditions. For Sammie's group, average social interactions IOA data across participants were 94% (range: 50-100%) in baseline sessions, 92% (range: 33-100%) in SPT sessions, 82% (range: 0-100%) in SPT-C sessions, and 92% (range: 75-100%) in SPT-D sessions. See Table 7 for average social interactions IOA data across all sessions and participants for Sammie's group. For Timmy's group, average social interactions IOA data across participants were 85.8% (range: 67-92.3%) in baseline sessions and 89.3% (range: 87.2-93%) in SPT sessions. See Table 8 for average social interactions IOA data across conditions.

Experimental design

The researcher used an A-B-A-B withdrawal design replicated for two participants (Gast & Baekey, 2014). A withdrawal design is a demonstration design that uses sequential and repeated introduction and withdrawal of the intervention. This design allowed the researcher to evaluate causality between the SPT intervention (i.e., training, materials and reinforcement) and the peers' social behaviors (i.e., stay, play, and talk behaviors) compared to their behaviors in the baseline condition. Withdrawal designs demonstrate experimental control when the intervention condition results in a level change (e.g., immediate increase) of the target behavior and when the adjacent baseline condition results in a level change in the opposite direction (e.g., immediate decrease) of the behavior. This design was appropriate for this study because withdrawal designs are suitable for: (a) interventions that target reversible behaviors; (b) interventions that can be readily withdrawn; and (c) changes in behaviors (including staying, playing, and talking) that are unlikely to result in harm, such that withdrawing the intervention does not raise ethical concerns.

For Sammie's group, the researcher expanded to a multitreatment design (C-D-C-D) for to compare the effects of two different versions of the SPT intervention (SPT + modified reinforcement (SPT-C) and SPT + modified arrangement (SPT-D)) on the peers' stay, play, and talk behaviors. A multitreatment design was added because in this component of the study the researcher's goal was to compare the two procedures to each other (and not to the baseline condition).

Withdrawal designs control for many common threats to internal validity. This design controls for maturation effects because behavior change is demonstrated bi-directionally (i.e., from baseline to intervention and from intervention to baseline conditions). Additionally, in the withdrawal design, each replication of effect (i.e., each introduction and withdrawal of the intervention) increases the internal validity of results by increasing demonstrations of experimental control. Replicating this design for similar participants allowed for inter-participant replication (i.e., external validity). Withdrawal designs address practical and ethical concerns by ending in intervention condition and thus, ending the study while there are potentially increasing therapeutic trends.

Procedures

Screening sessions. Before conducting the first baseline condition, the researcher, a graduate student in special education, selected four peers based on teacher report. To ensure target children met inclusion criteria, the implementer conducted probe screening sessions with participants who met initial screening criteria following receipt of parental consent. Probe sessions for the target child were a 5-min session during free play in the classroom with one of the peer participants. During these sessions, the peer participant: (a) said the target child's name and offered a preferred item and (b) said the target child's name and showed the child a toy. For

both types of trials, data were collected on whether the target child looked at the peer and/or toy, and to qualify for study participation, each participant had to respond to three out of the four peer bid's for attention. Prior to these probe sessions, the implementer role-played both of the scenarios with the peer. See Appendix B for the data form for the probe session.

Baseline. Baseline sessions occurred once or twice a day for 5-min during a typical or researcher-contrived free play in the target child's classroom. To begin the session, the researcher gathered the three participants, and said "TP1, TP2, and TC, it's time to play!" The implementer did not interact with or prompt the participants during the session. The participants were able to play anywhere in the classroom and had access to all toys that were available in the classroom. The teachers in the classroom were asked to not interact with the participants during these sessions unless a participant's behavior might result in harm.

SPT training sessions. After baseline sessions were conducted, three (Timmy's group) or four (Sammie's group) 15-min training sessions were conducted in a separate room down the hall from the target child's classroom or in the child's classroom at a time when non-participants were absent. The training sessions generally occurred in the morning and afternoon across two consecutive school days, except in the case of child absences. During each session, one or more strategies (e.g., play with the same toys as your buddy; give your buddy a toy) were introduced, explained, and demonstrated via role-play with a second implementer, a doctoral student in Early Childhood Special Education.

During the first training session for both Sammie's and Timmy's groups, the implementer taught the participants to stay with and do what their buddy is doing. At the end of the first training session, the implementer explained the contingency of staying, playing, and talking and receiving tokens to earn a reward. During the second session, the implementer taught the participants give their buddy a toy and to manipulate the same materials. During the third session for Sammie's group, the implementer taught the participants to say their buddy's name, ask their buddy questions, and comment on what their buddy is doing both verbally and with an AAC device. During the fourth training session for Sammie's group, the researcher introduced the AAC device to the peers and allowed them to explore the relevant pages. The peers were then taught how to appropriately communicate with the AAC device, and practiced with the second implementer. For Timmy's group, the third and fourth training sessions (described above) were combined because there was only one peer. In all training sessions, the implementer provided each child with three behavior-specific praise comments related to strategy use. During the role-play practice sessions, the implementer praised each child approximately once per minute or prompted the child to engage in a certain behavior and then praised the child. See Appendix H for scripts for each of the SPT training sessions.

SPT. SPT sessions occurred for 5 min in the mornings or afternoons in the free play area of the target child's classroom. To begin the session, the implementer gathered the three children in an area of the classroom and say "For 5 minutes, we are going to be buddies! We are going to stay, play, and talk with our buddy. [Peer 1] and [Peer 2], you are buddies with [Target child] and [Target child], you are buddies with [Peer 1] and [Peer 2]. Time to play!" During the session, the participants played with toys available in the classroom and adults other than the implementer did not interact with the participants except to prevent physical harm. During the session, the implementer provided descriptive feedback every minute to each child on a rotating schedule. If the target child had been staying next to one of the target peers, the implementer provided him/her a token on the respective column on the token board. If the target peers had been staying next to the target child, the implementer provided him/her a token on the respective

columns on the token board. Although the participants received tokens for staying, the descriptive feedback provided was a reminder for the next behavior in the hierarchy stay, play, talk. For example, if the peer was staying next to the target child but not playing, the peer received a token/praise for staying and a reminder to play with the target child. At the end of the session, the implementer gathered the children again and provide brief social praise, and the participants chose reinforcers from an array of edible and tangible items.

Withdrawal to baseline. After there was a clear level change between the baseline and SPT session for the target behaviors, the reversal to baseline phase was implemented (see Figure 1). The reversal implementation procedures were the same as the baseline sessions described above. The session begun with the implementer delivering the task direction "TP1, TP2, and TC, it's time to play!" These sessions did not include the SPT strategies poster, the token board, or any reinforcement.

SPT with modified reinforcement (SPT-C). After the second phase of intervention was implemented for Sammie's group, a C condition was implemented to target increasing the peers' play and talk behaviors. In this condition, the general procedures from the original SPT condition were followed (i.e., contingency review, task direction). However, the reinforcement system consisted of 10 (compared to 5) total opportunities to receive tokens. In this condition, the participants received tokens for *playing* (rather than just staying) with the target child. This reinforcement was provided on the same 20-s rotating schedule. Additionally, every minute (e.g., 0:00-1:00, 1:00-2:00) each participant was provided a token for the first time they talked to the target child during the minute. Thus, at the end of each participant's 1-min interval, they were provided: (a) a token for playing *or* feedback on playing if they were not already and (b) a model for talk if they had not already received reinforcement for talk during the previous minute.

SPT with modified arrangement (SPT-D). This condition was implemented for Sammie's group after there was no clear level change in the peer's level of play behaviors between the B and C conditions. The procedures for this condition consisted of exactly the same procedures as the C condition, but only one peer was present for each session (i.e., sessions included either TP1 and TC or TP2 and TC). Thus, instead of providing feedback every 20 s to one of the participants, the experimenter provided feedback every 30 s with the same rotating schedule.

Procedural Fidelity

Procedural fidelity data were collected for at least 33% of sessions across all conditions, implementers, and participants by a non-implementing data collector. After data collection, the researcher reviewed the procedural fidelity data before beginning the next session. Procedural fidelity of baseline, training, and intervention sessions was collected by a data collector via video. Procedural fidelity was measured separately across each participant, behavior, and session. Procedural fidelity was calculated on a point-by-point basis ((correct behaviors/[correct + incorrect behaviors]) * 100) for each behavior (Gast & Ledford, 2014). These data are reported separately for each behavior, participant, and for the session overall. See Table 7 for the procedural fidelity data across conditions.

For the 5-min baseline sessions and withdrawal sessions, the implementer should not have interacted with the participants after delivering the task direction "it's time to play." See Appendix I for procedural fidelity data sheets for all classroom sessions. SPT training sessions should have lasted for approximately 15 minutes. The implementer should have: (a) ensured all correct materials (i.e., SPT strategies visuals, reinforcers, toys) are present before beginning; (b) introduced the strategies for the day; (c) checked with each participant at least once to make sure

they know who their buddy is; (d) praised each child with three behavior-specific praise statements related to any SPT strategy; (e) provided the children with two reinforcers at the end of the session. See Appendix J for procedural fidelity data sheets for the SPT training sessions.

SPT classroom sessions were designed to last for 5 minutes. During SPT sessions, the implementer behaviors were to: (a) remind the participants to stay, play, and talk with his/her assigned buddy before the session begins; (b) begin the session upon delivery of the task direction "it's time to play;" (c) avoid interaction with any of the participants during the session unless a child is in physical danger; (d) post SPT strategies visuals at the children's eye-level in the free play area of the target child's classroom; (e) provide descriptive feedback to each child every minute; (f) provide a token to each child every minute if he/she has been staying with the target peer; and (g) provide the corresponding number of reinforcers (based on number of tokens earned) to each child at the end of the session.

CHAPTER III

RESULTS

Videos were coded after every session and data were graphed and visually analyzed each day. Data are presented as the percentage of intervals that peers engaged in staying, playing, and talking behaviors. Experimental decisions regarding condition changes were determined based on the presence of at least three consistent stay data points in a condition, or a sufficient number of data points to indicate variability.

Sammie's group A (Jake and Matt). Jake's and Matt's levels of stay behaviors during both baseline conditions were consistently at or near 0% of intervals, ranging from 0% to 8% of intervals. In the first session of the SPT condition, there was an immediate level change to 100% for Jake and 93% for Matt. However, data were variable for the remaining sessions in this condition (minimum value of 25% for Jake and 45% for Matt). During the second SPT condition, data were also variable, though the last four sessions were more stable than the initial sessions, with a range of 77% and 100% for both participants. During the first SPT-C condition, data for Matt were consistently high between 90 and 100%; data for Jake initially dropped to 38%, but were then stable between 88 and 95%. In the first SPT-D condition, Matt's data were consistently at 100%; Jake's data were also at a lever higher than baseline, but more variable. In the second SPT-C condition, both participants' data initially dropped to 45 and 50%, then increased to 82 to 100% of intervals for the rest of the condition. In the second SPT-D condition, Matt's and Jake's levels of stay were high yet slightly variable. Thus, as shown in the top panel of Figures 1 and 2, levels of stay increased in variability and significantly increased in level in the SPT conditions relative to baseline. In the last four conditions (i.e., C-D-C-D), levels of stay were generally higher and slightly less variable in the SPT-D conditions relative to the SPT-C conditions.

Jake's and Matt's play behaviors were stable at 0% of intervals in both baseline conditions. In the first SPT condition, there was a slight increase in level, which was larger for Matt than for Jake. In the second SPT condition, Matt's and Jake's play levels were highly variable. In the first SPT-C condition, Matt's play data continued to be variable though decreased slightly (2-45% of intervals); Jake's data were still highly variable. In the first SPT-D condition, there was a clear level change and decrease in variability in both Matt's and Jake's data; Matt's play data were between 73-87% of intervals and Jake's play data were between 58-85% of intervals. In the second SPT-C condition, play data for Matt and Jake were highly variable. In the second SPT-D condition, Matt's data were initially similar to the previous SPT-C condition, with an increasing trend; due to the trend and relative dearth of data points, it is difficult to draw conclusions about play levels in this condition. Jake's data were similar to the first SPT-D condition. Thus, across participants, play data were at 0% levels in baseline conditions; data were slightly higher yet highly variable in the SPT and SPT-C conditions; data were higher and less variable in the SPT-D conditions. See the second panel of Figures 1 and 2 for graphs of Matt's and Jake's respective play behaviors.

Jake's and Matt's levels of talk were at 0% of intervals for both baseline conditions and the first SPT condition. In the second SPT condition, there was a slight increase in level, which

was larger for Matt (13%) than for Jake (2%). In both SPT-C conditions, Matt's and Jake's talk data were consistently at or slightly above 0% of intervals. During the first and second SPT-D conditions, Matt's data slightly increased in level and were more variable; Jake's data increased in level and were less variable. Thus, data were at 0 or very close to 0% in baseline, SPT, and SPT-C conditions, and were higher though more variable in the SPT-D conditions. See the bottom panel of Figures 1 and 2 for graphs of Matt's and Jake's talk behaviors, respectively.

Data were also collected on the number of Matt's, Jake's, and Sammie's social interactions. Matt's and Jake's number of nonverbal social interactions were at or near 0 across all conditions; in the SPT-D conditions, nonverbal interactions increased in variability for Matt (with outliers of 8 and 11 interactions) and slightly in level for Jake (range 2-4). Matt's and Jake's number of verbal interactions during the baseline and SPT conditions were consistently at or near 0. In the first SPT-C condition, there was a small level change in verbal interactions; Matt's verbal interactions increased between 1 and 4 and Jake's increased to between 2 and 5, with little overlap with the previous condition. In the first SPT-D condition, there was an immediate and consistent level change, ranging between 4-9 for Matt and 5-19 verbal interactions for Jake. In the second SPT-C condition, verbal interactions immediately decreased in level, though were variable. In the second SPT-D condition, an increasing trend was present for Matt; data ranged from 1 to 11 interactions. For Jake, there was an immediate and clear increase in number, ranging from 14 to 24 social interactions. For Sammie, these data were low and variable across conditions, and no changes in level, trend, or variability were temporally associated with condition changes. Thus, as shown in the bottom panels of Figure 1 (Matt) and Figure 2 (Jake), and Figure 3 (Sammie), the SPT-D conditions resulted in increased levels of verbal social interactions for both Matt and Jake, and no changes in interactions for Sammie.

Timmy's group B (Mark). Mark's levels of stay during the first baseline condition were highly variable, ranging from 0% to 100% of intervals. In the first SPT condition, there was an immediate and consistent level change to 85%; data stabilized to at or near 100% during the next four sessions. In the second baseline condition, there was a slight decrease in level from SPT, though the data were variable. During the second SPT condition, there was an immediate level change to 95%, with all data points consistently between 78 and 95% of intervals. Thus, the data were highly variable and generally lower level in baseline (though there is some overlap with the SPT conditions), and the data were slightly variable though generally high in the SPT condition. Although the data in the second iteration of the baseline condition were only slightly lower than the SPT condition, this is not unusual in A-B-A-B designs (Gast & Ledford, 2014). See the top panel of Figure 4 for the graph of Mark's stay behavior.

Mark's play data were at or near 0% of intervals during the first baseline condition. In the first SPT condition, there was a clear and consistent level change, with data ranging from 45 to 75% of intervals. In the second baseline condition, data were highly variable, ranging from 0 to 52% of intervals. In the second SPT condition, data were significantly less variable and returned to levels similar to the first SPT condition. Thus, Mark's levels of play was low and/or highly variable in the baseline conditions and higher and more consistent in the SPT conditions. See the second panel of Figure 4 for the graph of Mark's play behavior.

Mark's levels of talk were at or near 0% during the first baseline condition. In the first SPT condition, levels of talk increased, though were variable, ranging from 0-23% of intervals. In the second baseline condition, levels of talk generally decreased and ranged from 0-12%. During the second SPT condition, talk levels were more consistently above 0, though did not increase above 10%. Thus, Mark's level of talk increased during the first SPT condition, and all

following conditions were generally, though variably, higher than the initial baseline condition. Thus, as shown in the third panel of Figure 4, no functional relation was demonstrated for this dependent variable.

Data were also collected on the number of social interactions of Mark (the target peer) and Timmy (the target child). These data were variable across conditions, and no changes in level, trend, or variability were temporally associated with condition changes. See the bottom panel of Figures 4 (Mark) and Figure 5 (Timmy) for the graph of number of nonverbal and verbal social interactions.

Procedural Fidelity

Procedural fidelity data were collected for 40.4% of all sessions for Sammie's group, ranging between 33%-50% of sessions for each participant and condition. The average procedural fidelity across all participants and conditions was 99%. Procedural fidelity data averaged 100% in the baseline conditions, 93% in training sessions, 98% in SPT conditions, 99% in SPT-C conditions, and 100% in the SPT-D conditions.

Procedural fidelity data were collected for 37.5% of all sessions for Timmy's group, ranging between 33%-40% of sessions for each condition. The average procedural fidelity across all conditions was 98%. Procedural fidelity data averaged 98.8% in the baseline conditions, 93% in training sessions, and 99% in SPT conditions. See Table 9 for procedural fidelity data.

CHAPTER IV

DISCUSSION

The findings of this study suggest two primary conclusions: (1) for Sammie's group, SPT with modified arrangement resulted in peers more consistently staying in proximity to, playing with, and talking more to the target child; and (2) for Mark's group, SPT resulted in the peer staying and playing with the target child more consistently.

Implications

There are several key implications from this study. First, characteristics of participants with disabilities may be important to consider when designing SPT interventions. Children with disabilities must have functional play skills in order to engage in play with their peers. Sammie's low frequency of engagement in functional play behaviors likely decreased the ease with she and her peers could engage in play together. Comparatively, Timmy's engagement in functional play was significantly higher than Sammie's; this may have contributed to Timmy's and Mark's higher levels of play in the SPT intervention compared to Matt's and Jake's play with Sammie. It is likely easier for children to join in play that is functional, rather than initiating play with the target child or joining play that is repetitive or manipulative in nature. Similarly, the target children's receptivity to peer initiations may be an important component of the differences in social interactions between groups. Timmy was more interested in responding to and initiating play with his peer; many social interactions occurred because of Timmy's initiations. The number of interactions initiated by Timmy is significantly higher than those initiated by Sammie; this likely affected the number of social interactions throughout the study.

The composition of peer dyads or triads may be important when designing a SPT intervention. The results from the SPT with modified arrangement condition for Sammie's group indicate that creating peer buddy dyads, rather than triads, may result in more staying, playing, and talking between the typically-developing child and the child with disabilities. Moreover, teachers reported that Matt and Jake were best friends and tended to play with each other in free play, which may have affected their motivation to initiate play with Sammie. Similarly, differing play interests and play levels between the target child and peers may have affected the levels of play. Several times Matt and Jake played together in a different center than Sammie; when prompted to play with Sammie, the peers explicitly stated that they would rather stay where they were because they preferred the toys in that center and they were not allowed to move the toys. After the researcher explained that the children could move toys during the SPT sessions, Sammie was not necessarily interested in the toys that the peers brought from other centers. Thus, teachers and researchers should choose groups carefully and be cognizant of possible drawbacks of choosing certain peer buddy groups based on friendships and play scheme preferences.

The SPT intervention was effective in increasing the levels of stay for both peer buddy groups and play for Timmy's group. This suggests that adult prompting is effective in increasing the amount of time peers remain in proximity to a peer with a disability, but more nuanced

strategies may be necessary to increase socially valid interactions. For example, the SPT with modified arrangement was more effective in increasing the play and talk behaviors of Sammie's peers. Since there were many differences between Sammie's and Timmy's groups (e.g., child with disability levels of functional play and receptivity to peers; dyad vs. triad buddy groups), it is not possible to determine which factors affected the different levels of SPT behaviors between groups.

Children's proficiency and frequency of using an AAC device may be an important consideration as it may affect a child with disability's level of communication. Though Sammie and Timmy did not have access to an AAC device in the classroom, they both were functional users of the device. On a typical day, however, Sammie communicated more often and more proficiently through sign language, though her signs were not widely acknowledged by her teachers or peers. Throughout the study, Sammie's communicative use of the device was limited; her functional use of the device consisted primarily of saying her peer's names. She typically repeatedly pressed multiple buttons, without shifting her attention or eye gaze shift to indicate communicative intent. Informal teacher report indicated that she used her device appropriately with adult support, which may suggest that talking with peers is a more sophisticated skill than requesting or commenting with adults. However, adult modeling was a component of the SPT with modified reinforcement and modified arrangement conditions, and her verbal interactions did not increase in these conditions.

At study onset, Timmy spent the majority of the session exploring his device, either in a center by himself or with Mark. Although the researcher allowed him access to the device prior to starting the study, this is likely an artifact of his lack of access to one, despite his ability to effectively communicate via AAC. Once Timmy started playing during the sessions, he used his device to appropriately communicate with Mark, typically during seated play. Mark adequately verbally responded to this communication, which may have influenced Timmy's use. However, anecdotally, Timmy used vocalizations and gestures more frequently than his AAC device to communicate with Mark. Though he did not have a large repertoire of intelligible vocalizations, Mark appeared to understand and respond to these communications in the context of active play. A recurring play scheme during the study included putting food into a shopping cart, and driving the shopping cart around the classroom; perhaps the active nature of this play scheme was less conducive to using the device than others (i.e., it is more difficult to carry the device around when pushing a shopping cart). However, when Mark and Timmy were engaged in seated play (e.g., cars; building towers), Timmy used his device more. Overall, Timmy's level of communication was higher than Sammie's and Mark's responsiveness was higher than that of Matt and Jake.

One component of the training sessions consisted of teaching peers to use the AAC device. The researcher modeled appropriate use and used prompting to teach the peers to comment with the device in the context of play with a confederate adult. Though Matt and Jake were initially interested in talking with the device, their button activations were primarily non-communicative (e.g., continually pressing multiple buttons). When Mark used Timmy's device in the beginning of the study, Timmy often pushed him, verbally said "no" or "mine," or grabbed the device back from him. This may have decreased Mark's motivation to activate the device as the study progressed. These observations suggest that more substantial peer training of AAC device use and more supported interactions between the child with and without disabilities may be necessary.

Limitations and Future Research

The operational definitions for play may have influenced the results of this study. The definition for play was such that the criteria for stay had to first be satisfied; thus, if the participants were engaging in a joint engagement interaction either in separate centers or farther than 4 ft apart, these situations were not coded as play. For example, Mark and Timmy's grocery store play scheme was not conducive to being within 4-ft of each other; though they were clearly engaging with each other (e.g., presence of joint attention), the definition for play did not capture these and similar instances of typical child play. Additionally, participants were reinforced for playing *next* to the target child, not necessarily with, which often resulted in children playing with different objects near each other. If the participants had been reinforced for higher levels of play (e.g., cooperative play), perhaps that would have increased the extent to which they engaged in higher play levels. Thus, the operational definition for the play code underestimated *and* overestimated the levels of play. Future research should include systems that specifically result in reinforcement for the peer when he/she is functionally playing with the target child. Additionally, future research should involve systematically fading the schedule of reinforcement to reduce prompt dependency and increase feasibility of classroom implementation.

Similarly, the coding system may have influenced the levels of coded talk. The use of momentary time sampling likely underestimated the coded occurrences of talk; it probable that some utterances between the target child and his/her peer were not captured by the coding system. However, nonverbal and verbal social interactions (the secondary variable) were coded separately; since this was a count-based measure, the verbal social interactions are a more accurate value for the amount of talk between the children. However, social interactions were coded after the study was complete, which did not allow those data to be used formatively.

Second, the target children's receptivity to peers and engagement in functional play may have decreased the impact of this intervention. There were repeated instances of unanswered questions or comments from Sammie's peers. Thus, Sammie's lack of responding to Matt and Jake may have decreased their motivation and/or willingness to continue to initiate meaningful interactions with her. Screening procedures included probe sessions which were designed to determine whether the children with disabilities were receptive to peer bids for attention. These probe sessions consisted of the peers saying the target child's name while offering a preferred item. However, perhaps the probe sessions should not have included the target child's preferred item to more accurately assess the child's willingness to attend to peers in a typical play setting; a more comprehensive intervention package (i.e., one that first teaches children to attend to their peers) may be beneficial for children who do not typically attend to their peers. Future researchers should implement the SPT intervention with target children who are likely to engage in more functional play and to respond to peers more readily.

This study was originally designed to be implemented in the classroom during typically-occurring free play activities alongside the other children in the classroom. After implementing several sessions with Sammie's group this way, sessions were then implemented in researcher-contrived free play settings. This was done after a parent of a non-participant demonstrated concern that rewarding some children for being near others might discourage them from including other, non-participating children. Thus, some sessions occurred while non-participating children were in the classroom and some while only the participants were in the classroom. This latter context may limit the likelihood of generalizing these stay, play, and talk behaviors to other contexts that are typically-occurring during the school day. Implementing this intervention on a class-wide basis during typically-occurring classroom activities may increase the acceptability

and generalizability of SPT. Similarly, despite Timmy's proficiency on the AAC device, he did not have access to one in his classroom. This also may limit the generalizability of these results since it is likely that his AAC communication is a gateway for increasing his social interactions with his typically-developing peers.

Lastly, social validity data were not collected, and additional data for Matt and Jake were not collected because the participants did not return to school after winter break. This lack of sufficient data limits the ability to draw conclusions regarding the effectiveness of the SPT with modified reinforcement compared to the SPT with modified arrangement conditions. Future research should further analyze the efficacy of creating buddy interventions with peer dyads compared to peer triads.

The purpose of this study was to investigate the effectiveness of a SPT intervention with an AAC training component on related peer behaviors (staying, playing, talking, and social interactions with a child with a disability). Despite the limitations, the findings of this study are significant because they suggest SPT interventions with peer dyads may increase the amount o time peers stay and play with children with disabilities who use AAC. Further research on this topic is warranted to address the ideal social skills intervention package for children with varied levels of AAC usage and other communication modes.

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Table 1
Inclusion Criteria for Target Children

	Measurement	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, but preferably has a diagnosed disability
Inclusion Criteria		
Play Level	Teacher report (Appendix A)	Ability to engage in pretend play
Expressive Language	Teacher report (Appendix A)	Ability to answer questions with at least one intelligible word
Peer Interaction	Teacher report (Appendix A)	Interacts with peers at a low rate: "never" or "rarely"
Peer Interaction (Probe)	Probe sessions in classroom (Appendix B)	Successfully responds to 3 of 4 probes

Table 2
Inclusion Criteria for Peers

	Measurement	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
Expressive Language	Teacher report (Appendix A)	Ability to answer questions with at least one intelligible word
Peer interaction	Teacher report (Appendix A)	Likely to interact with peers during free play: “often” or “very often”

Table 3

Operational Definitions, Examples, and Non-examples for Stay-Play-Talk Behaviors

Behavior	Definition	Example	Non-example	Not codable
Stay	Any body part of target peer within 1.2 m of any body part of target child **and** the target peer and target child are in the same center of the classroom **or** the target peer and target child or oriented towards each other or in the same direction	Target peer stands next to target child; target peer sits in chair next to target child, who is sitting or standing; target peer has 1 foot/arm in the space the target child is in (or vice-versa)	Target peer is more than 1.5 m away Target peer is in a different space than the target child Target child has both feet outside of the space the target peer is in	Target child and/or target peer are off camera and could be within stay range
Play	Target peer manipulates materials while target child manipulates the same materials or materials that have a related function; target peer shows or gives materials to target child; target peer engages in pretend play while target child engages in related pretend play	Target peer hands target child a block; target peer drinks from a cup while target child picks up a plate	Target peer builds a bridge with blocks while target child picks up a cup; target peer taps target child on the shoulder	Unable to see target peer and/or target child's hands and cannot reasonably assume both are manipulating objects; target peer and/or target child's hands have been hidden for 5+ sec
Talk	Target peer vocalizes language or activates AAC device directed to target child or to both peers about shared materials	Target peer says "Can I have that?" to target child; target peer presses "I like that" on AAC and looks at peer	Target peer screams or cries; target peer presses multiple buttons on AAC with his head down	

Note 1. Under Play, holding objects counts as "play" within the first interval. The child must manipulate the object within the next interval for it to count as "play."

Note 2. Manipulating AAC device can count as "play" if both children are manipulating the device

Note 3. If cannot see hands: child must a) have visibly moved object within last 5-sec AND b) definitely be holding object.

Table 4

Operational Definitions, Examples, and Non-examples for Social Interactions

	Definition	Example	Non-example
Verbal	An interaction between the target child and the peer that involves vocalization, AAC activation, or signing ***and*** a second indicator of (a) *orienting towards or shifting eye gaze towards* communicative partner within 1-s of the end of verbal utterance or (b) saying something directly and immediately in response to a peer's actions or (c) saying the communicative partner's name or (d) telling peer to come	Child presses button on AAC, vocalizes while looking at peer; child presses button on AAC and looks in the general direction of peer; child says "let's build a tower next" while looking in the general direction of target child; target child hits peer and peer says "no" without looking at target child	Child presses button on AAC and vocalizes while looking at AAC; child presses button on AAC and vocalizes while looking at toy
Nonverbal	An nonverbal interaction between the target child and the peer that involves a communicative gesture, point, show, or give (a give may be executed by hand or foot)	Peer hands the target child a toy; target child gives peer a high five; peer shakes head no at target child; target child kicks a ball to peer	Child throws a toy at target child; child points towards iPad button to activate but does not activate button; child points to same toy multiple times within 2 s

Note. Each instance of verbal and nonverbal interaction is coded separately.

Table 5

Average SPT IOA Data across Sessions for Sammie's Group

	Baseline			**SPT**			**SPT-C**			**SPT-D**		
	Stay	Play	Talk	Stay	Play	Talk	Stay	Play	Talk	Stay	Play	Talk
Matt	97% (92-100%)	100%	100%	88% (55-100%)	97% (93-100%)	98% (92-100%)	96% (88-100%)	95% (86-100%)	99% (87-100%)	100%	92% (87%-92%	99% (98-100%)
Jake	99% (98-100%)	100%	100%	98% (95-100%)	95% (85-100%	100%	96% (92-100%)	95% (93-98%)	99% (98-100%)	99% (98-100%)	92% (87-97%)	96% (93-100%)
Overall	98% (92-100%)	100%	100%	93% (55-100%	96% (85-100%	99% (92-100%	96% (88-100%)	95% (86-100%	99% (97-100%)	99% (98-100%)	92% (87-97%)	98% (93-100%)

Table 6

Average SPT IOA Data across Sessions for Mark (Timmy's Peer)

Baseline			**SPT Intervention**		
Stay	Play	Talk	Stay	Play	Talk
98%	100%	98.8%	95.8 %	91%	96.5%
(95-100%)		(97-100%	(81-96%)	(90-100%)	(90-100%)

Table 7

Average Talk IOA Data across Sessions for Sammie's Group

	Baseline	**SPT**	**SPT-C**	**SPT-D**
Matt	100%	82% (33-100%)	81% (29-100%)	92% (75-100%)
Jake	100%	93% (67-100%)	84% (84-100%)	86% (84-100%)
Sammie	83%	100%	81% (0-100%)	100%
Overall	94% (50-100%)	92% (33-100%)	82% (0-100%)	92% (75-100%)

Table 8

Average Social Interactions IOA Data across Sessions for Timmy's Group

	Baseline	**SPT**
Mark	88.7% (80-100%)	87.2% (81-90.3%)
Timmy	89.1% (67-100%)	91.7 % (84.3-97%)
Overall	89% (67-92.3%)	89.4% (87.2%-93%)

Table 9
Procedural Fidelity Data Across Conditions

	Baseline	**Training**	**SPT**	**SPT-C**	**SPT-D**
Sammie	100%	93%	98% (95-100%)	99% (95-100%)	99% (95-100%)
Timmy	98.8% (94-100%)	93%	98.8% (95-100%)	--	--

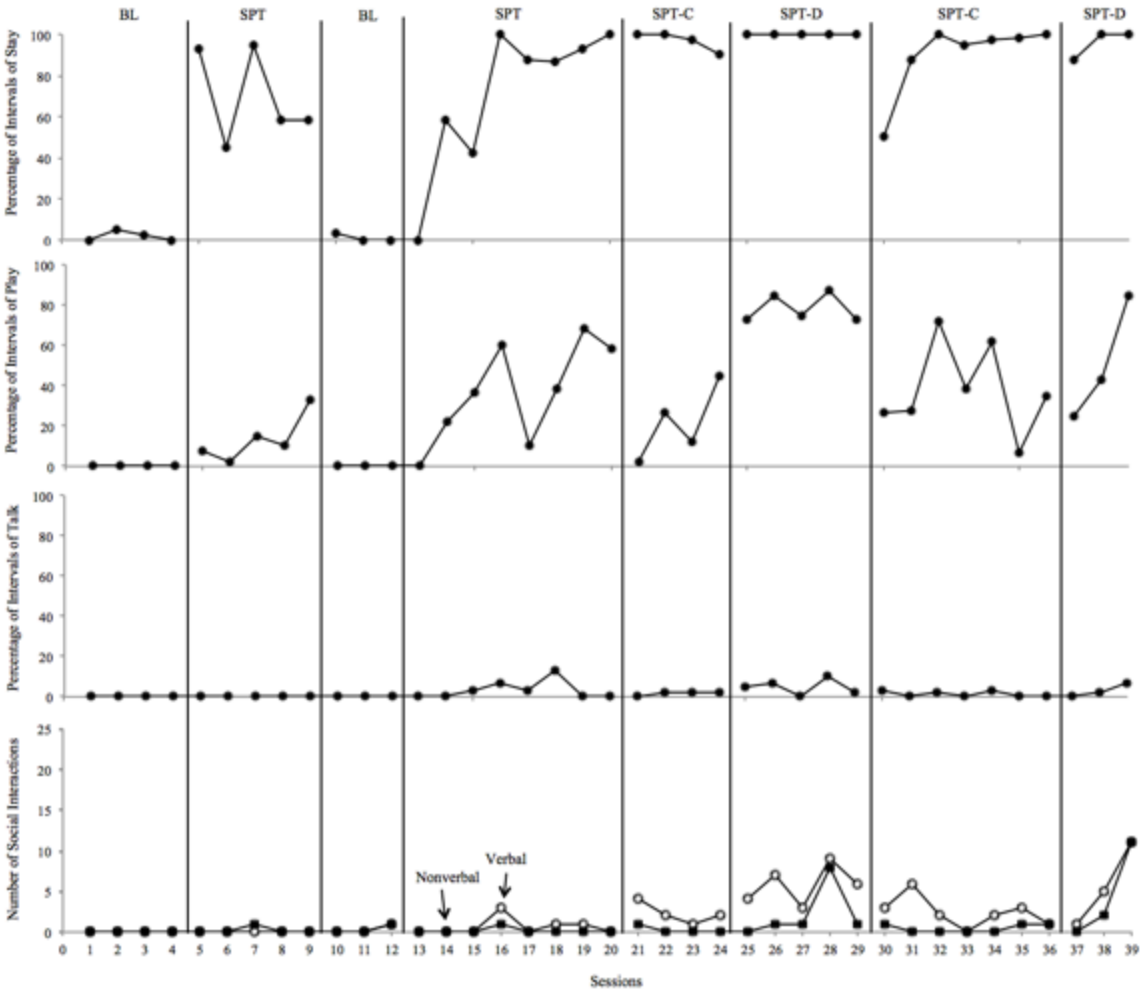


Figure 1. Percentage of intervals Matt engaged in target behaviors (first three panels) and number of nonverbal and verbal social interactions (bottom panel).

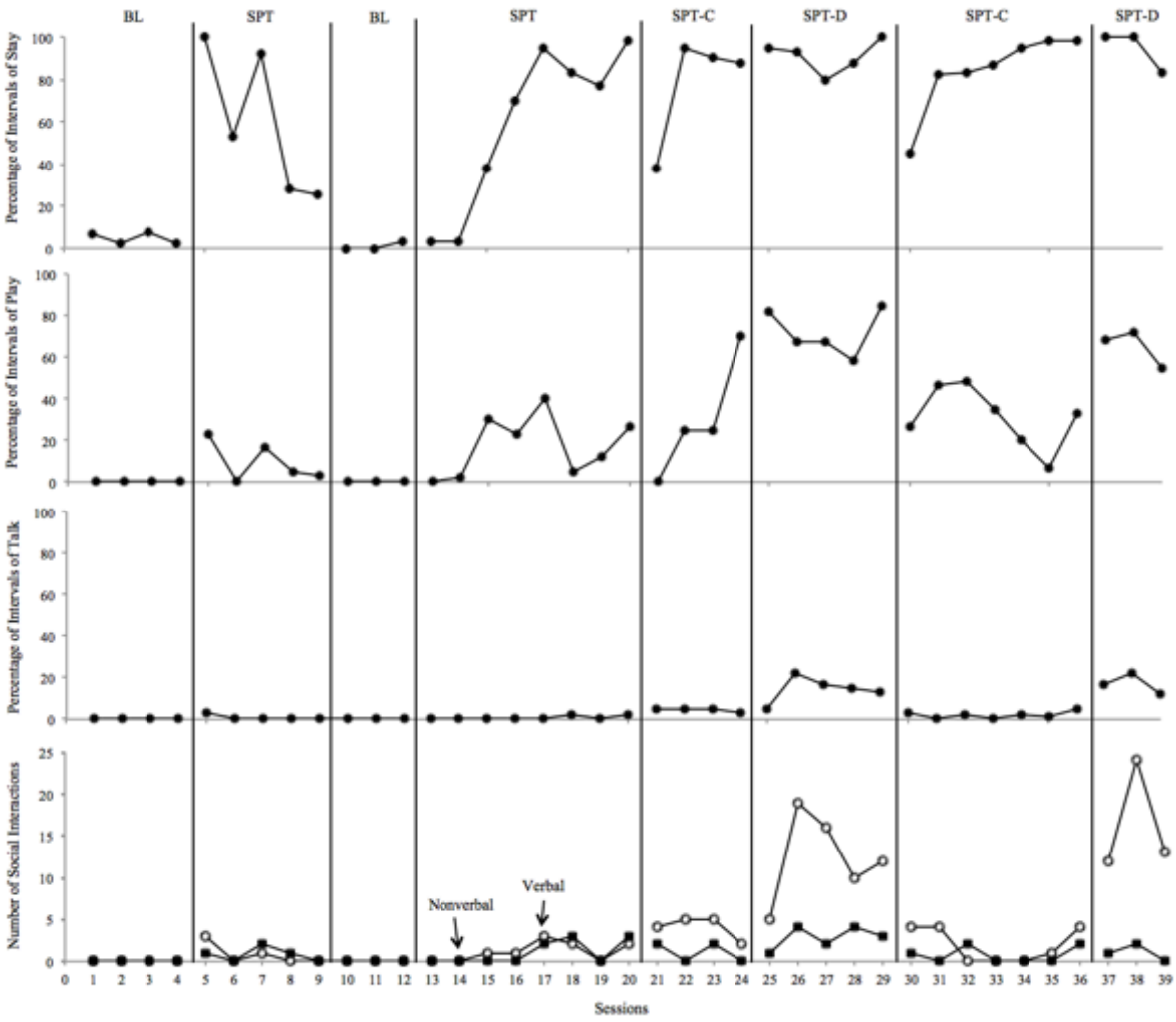


Figure 2. Percentage of intervals Jake engaged in target behaviors (first three panels) and number of nonverbal and verbal social interactions (bottom panel).

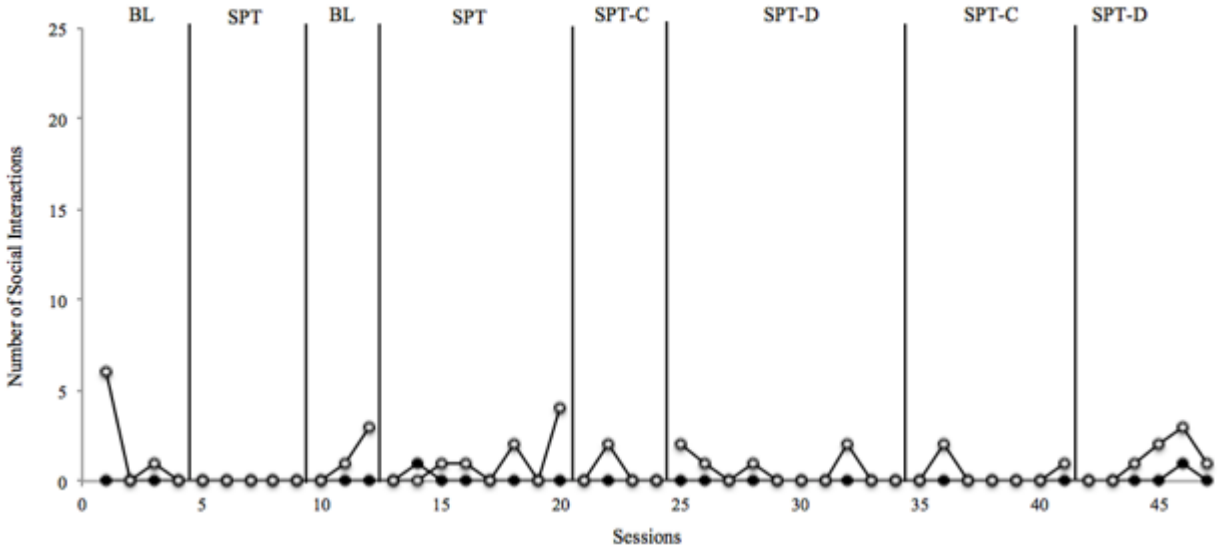


Figure 3. Sammie's number of nonverbal and verbal social interactions.

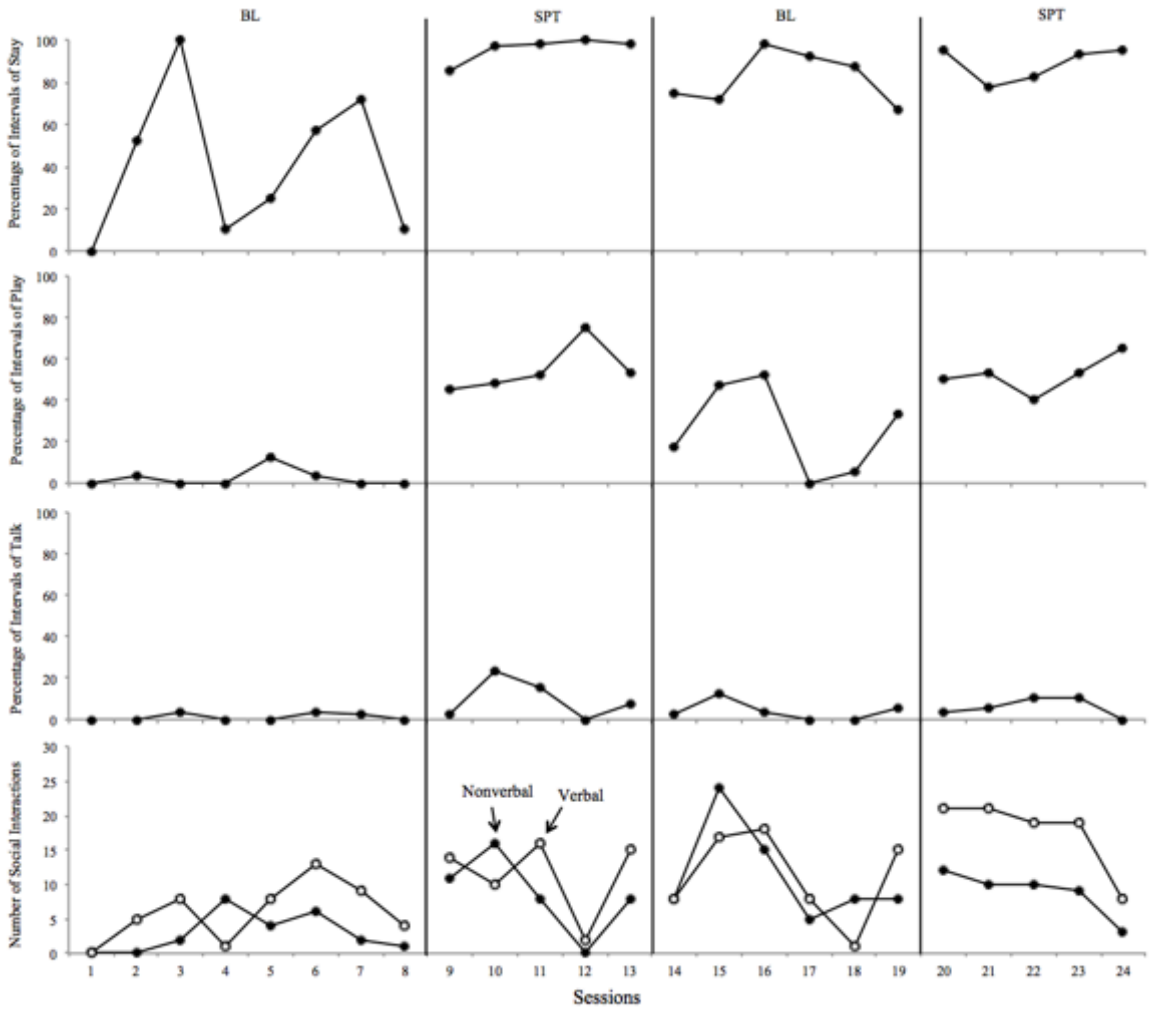


Figure 4. Percentage of intervals Mark engaged in target behaviors (first three panels) and number of nonverbal and verbal social interactions (bottom panel).

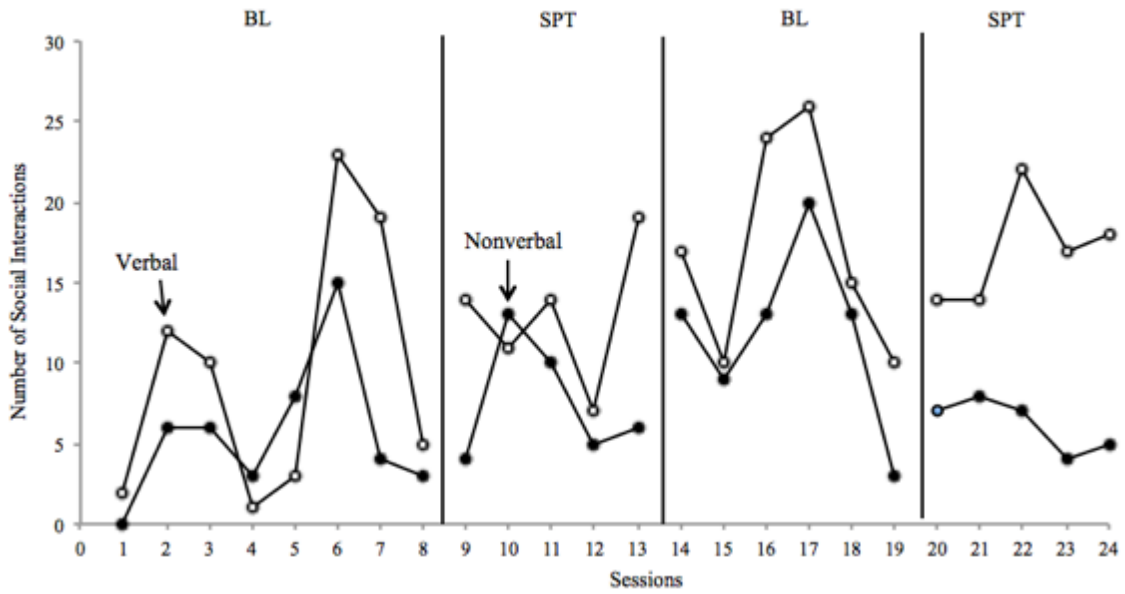


Figure 5. Timmy's number of nonverbal and verbal social interactions.

Appendix A

Teacher Report Form

Name _____ Date _____ Job Title _____

Child's Name _____

Child's birthdate _____

For the following questions please circle YES or NO.

Child is currently eligible for special education services. YES NO

If YES, indicate what the diagnosis and/or eligibility category is:
_____

Child has demonstrated the ability to engage in pretend play. 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

Child can respond to questions using at least one intelligible word. YES NO

Please rate this child's frequency of compliance when given directions from a teacher:

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

Please rate how often this child interacts with peers in free play:

1	2	3	4	5
Never	Rarely	Sometimes	Often	Very Often

Appendix B

Target Child Probe Data Collection Form

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 or reaches for reinforcer
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 C

SPT Strategies Poster

STAY

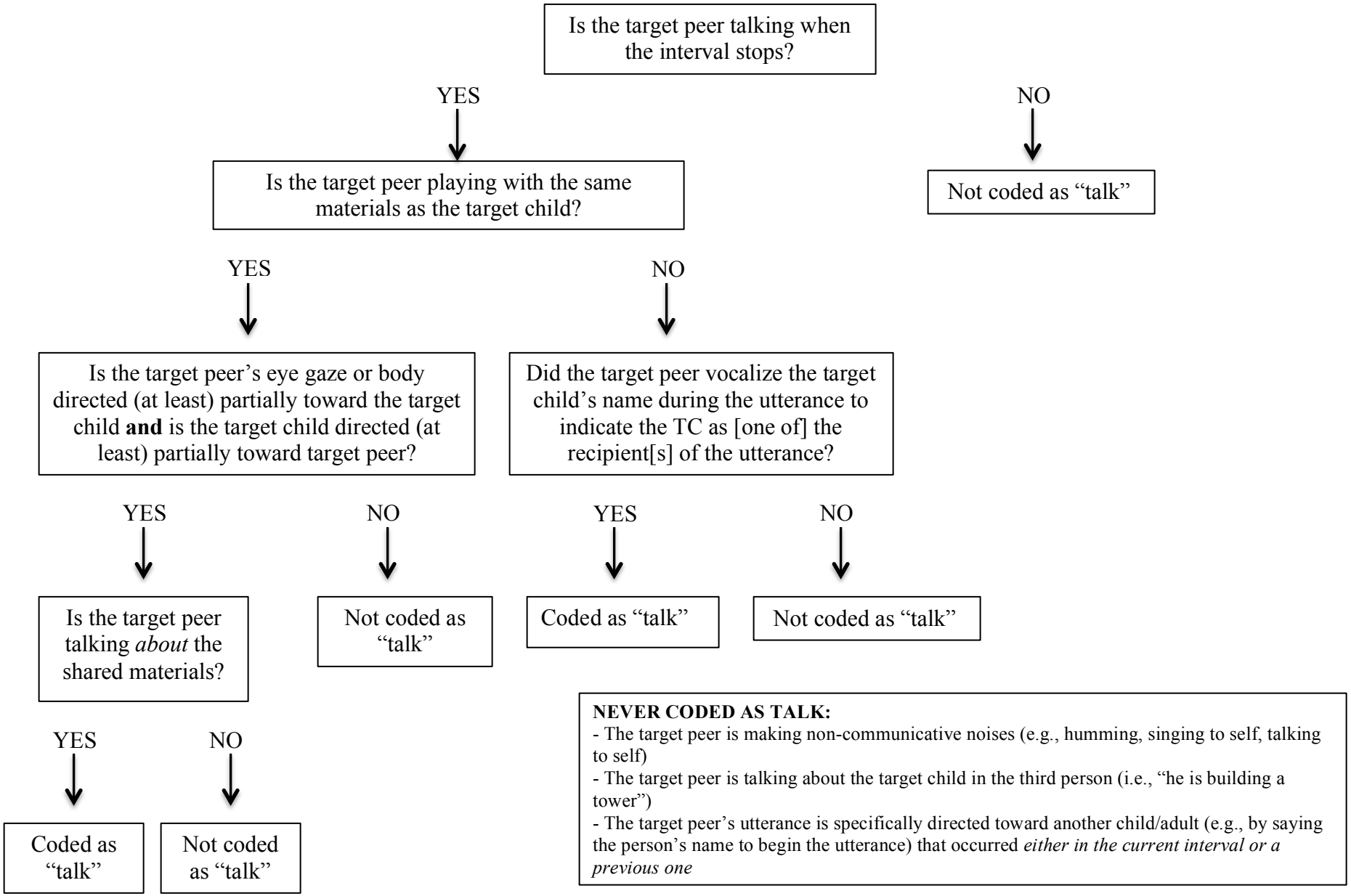
PLAY

TALK

Appendix D

Reinforcement Materials: Tokens and Token Board

Appendix E
Procedures for Coding Talk



Appendix F

Example of Procoder Data for Dependent Variables

File Media Control Data

Save Export Media Replay Seek Delete Insert Mark Add Row

File Info Data

Time	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
00:02:27.57	S			S		
00:02:32.57	S			S		
00:02:37.57	S			S		
00:02:42.57	S			S		
00:02:47.57	S			S		
00:02:52.57	S			S		
00:02:57.57	S	P		S	P	
00:03:02.57	S	P		S		
00:03:07.57	S	P		S	P	
00:03:12.57	S	P		S	P	
00:03:17.57	S	P		S	P	
00:03:22.57	S	P		S	P	
00:03:27.57	S	P		S	P	
00:03:32.57	S	P		S		
00:03:37.57	S	P		S	P	
00:03:42.57	S	P		S		
00:03:47.57	S	P		S		
00:03:52.57	S	P		S		
00:03:57.57	S	P		S	P	
00:04:02.57	S	P		S		
00:04:07.57	S	P		S	P	
00:04:12.57	S			S		

Appendix G

Data Summary Sheet Example

Date	Condition	Primary	S (Prim)	P (Prim)	T (Prim)	SP (Prim)	ST (Prim)	SPT (Prim)	None (Prim)
8/25/16	Baseline 1	KS	0	0	0	0	0	0	100
8/29/16	Baseline 2	KS	5	0	0	0	0	0	95
830/16	Baseline 3	KS	2	0	0	0	0	0	98
9/1/16	Baseline 4	KS	0	0	0	0	0	0	100
9/13/16	SPT 1	KS	93	8	0	8	0	0	7
9/14/16	SPT 2	KS	45	2	0	0	0	0	55
9/15/16	SPT 3	KS	95	15	0	2	15	0	5

Appendix H

SPT Training Session Scripts

Training Session 1
Strategies: stay with your buddy, do what your buddy is doing

Hi friends! We are going to start doing some special activities with each other! We're going to learn how to be buddies to each other!

A buddy is someone who plays and talks with their friends. Being a buddy to someone makes them happy. It's important to be buddies to each other because that's how we include everyone in the classroom. We all like to play and talk with our friends, and being a buddy means you're making an extra effort to be friends with someone.

Today we're going to talk about the first way to be a buddy. The first way is to stay with your friend. That means wherever your friend goes, you go! If your friend leaves the sensory table and goes to play in the kitchen, you should leave the sensory table and play with them in the kitchen.

[Target peer 1 (TP1)], your buddies are [target child] (TC) and Target Peer 2 (TP2). [TP2], your buddies are [TC] and [TP1]. [TC], your buddies are [TP1] and [TP2].

Reinforcement contingency (part of Training Session 1)
Before we practice, we are going to learn how we can work together to earn rewards for being buddies! Every minute that you are being buddies, you can earn a token! At the end of each session, you all get to pick out a reward for every token that you have. You guys will earn a token when you are staying with your buddy.

This is the timer, the token board, and the tokens. I'm going to hold the timer, and each time the timer goes off I will put a token on the board if you have been staying with your buddy. When we're all done, you will each get a reward for every token that you have.

First we're going to each have a turn to practice being buddies. It's going to be [TP1]'s turn first. [TP1], pretend [confederate adult (CA)] is your buddy. Look, CA is playing with the blocks. What can you do?

We're going to practice earning tokens for 2 minutes by playing with some cool toys and practicing being buddies to each other. When the timer goes off, it's going to be one buddy's turn to earn a token, and I'm going to check if you have been staying with your buddy. If you have, I'll put a token on the token board. We will all check in together at the end. Remember, you can be a buddy by: staying and playing with each other. Let's practice!

Training Session 2
Strategies: hand your buddy a toy, manipulate same materials

Yesterday, you all did a really great job of staying and playing with your buddy. To remind all of us, who can tell me what being a buddy is? And why do we want to be buddies to each other?

Now we're going to talk about more ways to be a buddy! First, you can hand your buddy a toy. If you're playing with food in the kitchen, you could hand your buddy a spoon so he can stir the food. Does anyone have any other ideas of toys you could give to your buddy?

Now, we're going to practice these 2 ways to be a buddy! We're going to practice giving toys and playing with the same materials. Now you are each going to earn a token for staying and playing with your buddy! When the timer goes off and it is your turn, you can earn a token for staying and playing. At end of the session, you will each get to pick rewards for each token you have. Let's play!

Training Session 3
Strategies: say your buddy's name, comment on what your buddy is doing, ask your buddy a question

Yesterday, you all did such a good job at being buddies. When you stayed and played with your buddies, you gave them toys and played with the same materials. Do you guys remember what being a buddy is? Why do we want to be buddies to each other?

There are three more ways you can be a buddy! First, you can say your buddy's name. Let's practice! TP1, say your buddy's name. TP2, say your buddy's name. TC, say your buddy's name (or point to your buddy). Great job everyone!

Next, you can comment on what your buddy is doing. If your buddy is playing with a puzzle, you could say, "Wow that's cool!" What are your favorite toys? What could you say about [specific toy]?

You can also ask your buddy a question. You could ask them "What are you doing?" or "Can I play?" What are some other questions you can ask? Great!

Some people use talkers to talk with their friends. This is [target child's] talker. This is a page with fun things to tell your buddy when you are playing with him/her (show page on AAC with general phrases). TC already knows how to use his/her talker. TP1 and TP2, you guys can each take a turn practicing talking on the talker. You can talk like this (provide example of talking on target child's talker).

While TP1/TP2 is practicing on the talker, TP2/TP1 and TC, you can pick one of these toys to play with (offer three choices).

Now we're going to practice these 3 ways to be a buddy. We're going to practice saying our buddy's name, commenting on what our buddy is doing, and asking your buddy a question. Now you can all earn tokens for staying, playing, and talking with your buddy. When the timer goes off and it is your turn, I will give you a token if you have been staying, playing, and talking with your buddy.

At the end of the play session, you will each get to pick rewards for how many tokens you have.

Training Session 4
Strategies: TP1 and TP2 AAC use

You guys have been doing a great job at being buddies! When you stayed and played with your buddies, you gave them toys and played with the same materials. Do you guys remember what being a buddy is? Why do we want to be buddies to each other?

Remember that some friends use talkers to talk to their friends? Well Sylvie is already really good at using her talker, and I want to help you guys be good at using her talker too!

One important thing to remember when using the talker, is to press the button ONE time and then wait until you hear it talk. Provide example**.**

You can also say what you want to say with your voice and with the talker. Provide example.

You can use the talker to talk like this to your friend (provide example of talking on target child's talker). Some things you can say using this talker are: (provide examples on AAC here). You can use the different pages on the talker when you are in different centers. Provide examples. We are going to practice using [TC's] talker while we play!

First let's practice saying our buddies' names on the talker. [TP1], it's your turn to say your buddy's name using the talker. [TP2], now it's your turn to say your buddy's name using the talker. Great!

Now we are going to practice in free play to earn tokens! When my timer goes off each minute, I will give you a token if you have talked to your buddy using the talker. At the end of the play session, you will each get to pick rewards for how many tokens you have.

TP1, for this session your buddy is TP2. TP2, your buddy is TP1. Let's practice!

IMPLEMENTER NOTE: During the 5-min practice session, each target peer will be prompted using a verbal + verbal/model prompting hierarchy each minute. The peer will *not* be prompted to use the AAC if he/she has already pressed a button communicatively in that minute. If so, the implementer will then instead praise the target peer at the minute-mark.

Appendix I

Classroom Session Procedural Fidelity Form

Date: _____ Session #: _____ Data Collector: _____ Implementer: _____

Baseline □ Stay, Play, Talk □ Withdrawal □ Generalization □

Beginning Time: _____ # Adults present ____ # Children present _____

End Time: _____ # Adults present ____ # Children present _____

Adult Behaviors

Session began within 15 s of task direction to play **YES NO**

Session lasted for 5 min +/- 10 s **YES NO**

SPT poster posted in free play area **YES NO**

Prior to session				During session		After session	
Reminder to S, P, T	Reminder of SR+	Gave task direction	Turned timer on	Provided feedback	Provided tokens if appropriate	Praise for S, P, T	Gave correct SR+

% correct implementer behaviors: ____/19 = _____

Minute	Reinforcement Occurred?		
	TP1	TP2	TC
0:00-0:30			
0:30-1:00			
1:00-1:30			
1:30-2:00			
2:00-2:30			
2:30-3:00			
3:00-3:30			
3:30-4:00			
4:00-4:30			
4:30-5:00			

Appendix J

SPT Training Session Procedural Fidelity Form

Date: _____ Session #: _____ Data Collector: _____ Implementer: _____

Beginning Time: _____ End Time: _____

Session lasted for 15 min +/- 2 min **YES** **NO**

Correct materials present **YES** **NO**

Implementer introduced correct topics for the session **YES** **NO**

Implementer provided reinforcers to each child **YES** **NO**

Record whether the implementer provides behavior-specific praise to each participant during the practice session. Each participant should have at least 1 check in each band of shaded boxes (e.g., 1 check in minute 1, and 1 check in minute 2). If the implementer provided reinforcement to at least 1 participant in each 30-s interval, this will be counted as correct.

Minute	Reinforcement Occurred?		
	TP1	TP2	TC
0:00-0:30			
0:30-1:00			
1:00-1:30			
1:30-2:00			
2:00-2:30			
2:30-3:00			
3:00-3:30			
3:30-4:00			
4:00-4:30			
4:30-5:00			

% correct = _____/14 = _____