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Using Behavior Skills Training To Teach Effective Conversation Skills To Individuals With Disabilities

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USING BEHAVIOR SKILLS TRAINING TO TEACH EFFECTIVE CONVERSATION SKILLS TO INDIVIDUALS WITH DISABILITIES

A Master's Thesis

Presented to

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In Partial Fulfillment

Of the Requirements for the Degree

Master of Science, Applied Behavior Analysis

By

Allison Lynn Schmidt

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ABSTRACT

A behavioral skills training (BST) package consisting of instructions, modeling an appropriate conversation, participant rehearsal, and constructive feedback, was used to teach appropriate conversation skills to three adults with developmental disabilities. A task analysis was used to define the steps of having a conversation. These steps included greetings, initiations, initiating a topic, responding, and maintaining a topic as the target skills. A nonconcurrent multiple baseline design across participants was used; an A-B-C format was embedded within the design for participants 1 and 2. Participant 3 was assessed using an A-B format. *In situ* was measured across three settings: each participant's home; the assessment room where the sessions were held; and the lobby of the facility housing the assessment room. Latency to begin a conversation with a confederate was measured during baseline and in all *in situ* settings. The results of the study demonstrated the BST package was effective in increasing the appropriate conversation skills of all participants and all settings, while decreasing the amount of time it took for participants to initiate a conversation.

KEYWORDS: behavior skills training, conversation, developmental disabilities, communication, social skills

This abstract is approved as to form and content

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I dedicate this thesis to my son, Judah.

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INTRODUCTION

Communication deficits are common among individuals with mental disabilities (Hattier, Matson, Sipes, & Turygin, 2011). Among these deficits is a particular difficulty with social interactions involving basic conversation skills. The use of socially appropriate conversation skills is a vital part of daily functioning for every individual regardless of cognitive or physical abilities (Hattier et al. 2011; McClintock, Hall, & Oliver 2003). The development of communication skills promotes the competencies necessary for creating and maintaining social relationships. Acquiring efficient use of socially appropriate language will enhance a person's quality of life and researchers have developed a wide variety of packages to address these social skills (van Balkom, Verhoeven, van Weerdenburg, & Stoep, 2010; Matson, 1982; Jackson, Fein, Wolf, Jones, Hauck, Waterhouse, Feinstein, 2003; Pierson & Glaeser, 2005).

One successful method for training acquisition of conversation skills used video modeling (Sherer, Pierce, Paredes, Kisacky, Ingersoll, & Schreibman, 2001). In this study the authors compared the efficacy of 'self' versus 'other' video-modeling for training conversation skills. Video models were introduced using a combination of alternating treatments and multiple baseline design to compare the effectiveness of two types of models. One version used the target individual him/herself as the video model and the other used a typically functioning peer. There was no significant difference of acquisition rate found by experimenters for the two video modeling types (see also Axelrod, Bellini, & Markoff, 2014).

Nuernberger, Ringdahl, Vargo, and Crumpecker (2013) evaluated the efficacy of using a behavioral skills training (BST) package that included *in situ* training and

reinforcement to teach vocal and non-vocal conversation skills to individuals with Autism Spectrum Disorder in natural settings. These procedures were implemented with three young adults using a treatment that consisted of instruction, modeling, rehearsal, and feedback. Neurnberger et al. (2013) used a task analysis to define the steps of having a conversation and assess verbal conversation skills, such as making comments related to the conversation topic, and non-verbal skills such as maintaining an appropriate proximity to the speaker. The experimenters allowed access to tangible reinforcement contingent upon consistent or improved performance with the target skills based on previous sessions. Implementation of the BST package demonstrated an immediate change in level of correct responding across all participants. Their study confirmed that the training package was effective and the skills were maintained during the eight-week follow-up. The authors did not measure the long-term effects of the training package and only limited generalization of the skills across settings.

Behavioral Skills Training

Behavior skills training (BST) is a comprehensive approach that uses a combination of instructions, modeling, rehearsal, and feedback to teach a wide range of complex behaviors to a variety of populations (Ward-Horner & Sturmey, 2012). BST has been shown to be effective in training teachers quickly in the generalized application of complex instructional procedures (Gianoumis, Seiverling, & Sturmey, 2012), teaching parents to conduct functional assessments and accurate data recording (Shayne & Miltenberger, 2013), and has decreased aggressive responses in adults with mild intellectual disabilities (Travis & Sturmey, 2013). In most BST training packages, a

trainer provides the trainee with instruction, the trainer then models the desired behavior, followed by the trainee rehearsing that behavior with the trainer. The trainee is given the opportunity to practice the learned behavior and the trainer will then provide feedback on the performance.

All aspects of BST are valuable but according to Ward-Horner and Sturmey (2012), feedback and modeling are possibly the most crucial components. Gianoumis, Seiverling, and Sturmey (2010) used a multi-component BST package, including instructions, rehearsal, modeling, and feedback, to effectively increase correct teacher performance on the implementation of Natural Language Paradigm (NLP) and also increase appropriate child vocalizations. The authors recorded correct staff performance during the NLP teaching sessions across two skills; performing a stimulus preference assessment and conducting an NLP teaching session. Four of the six children that participated increased appropriate vocalizations following staff training.

Travis and Sturmey (2013) used BST to treat aggression in three adults with mild intellectual disabilities in a locked forensic facility. Each participant had a history of criminal charges but was deemed incompetent to stand trial. The investigators assessed and presented discriminative stimuli systematically for aggressive behavior and taught an alternative behavior. Five replacement behaviors were taught to address five aggression-provoking antecedent stimuli. The replacement behaviors were selected to serve a similar function as the aggressive responses. BST using instructions, modeling, rehearsal, and feedback increased use of replacement behaviors by over 70 percent and reduced aggressive behavior successfully by teaching alternative responses to provocative stimuli.

Parents of individuals with disabilities have benefited from BST practices as well. Shayne and Miltenberger (2013) taught parents how to conduct ABC recording, summarize data collection, and other functional assessment skills by using a BST package. Parents participated in a three-hour class to teach the three skill sets; A-B-C recording, writing a summary statement based on the data collected, and making appropriate treatment choices. The BST intervention package included instruction, modeling, rehearsal, and feedback. Results of the training package showed that it was possible to teach parents to conduct a functional assessment and select appropriate treatment strategies using behavior skills training.

Stewart, Carr, and LeBlanc (2007) taught a mother and sibling of a child with Asperger's syndrome to use BST to increase the appropriate social skills of their child/sibling. The family implemented a BST package incorporating instructions, modeling, rehearsal, and feedback. The researchers observed and recorded family member performance while learning BST, while teaching the target social skill, and while the client responded during BST sessions for each target skill. The client demonstrated an increase in each of the social skills targeted for concern (eye-contact, asked if bored, changed topic, and avoid problem topics) after their family members had received BST.

Kornacki, Ringdahl, and Nuernberger (2013) performed a component analysis of the BST package for training conversation skills used in the study by Neurnberger et al. (2013). Kornacki, et al. (2013) assessed the following components of the BST package: instructions, modeling of an appropriate conversation, rehearsal, *in situ* training with feedback in a private room, and *in situ* training with feedback plus reinforcement. The experimenters found that results of the BST package were consistent with those of

Nuernberger et al. (2013) and constituted an effective strategy for teaching conversation skills to individuals with developmental disabilities. The authors suggested that there was not one specific component responsible for the effective acquisition of conversation skills. BST functioned best as a package treatment that included all components.

Current Study

The current study was an extension of Nuernberger et al (2013) and Kornacki, et al. (2013) and sought to adapt the BST packages used by those authors to increase appropriate conversation skills of three individuals with intellectual and developmental disabilities using a non-concurrent multiple baseline design. The current study intended to expand on previous research by including measures of response latency, assessing behavior change over longer periods of time and across multiple settings, and including tangible reinforcement when a client's progress slowed or decreased in trend.

METHOD

Participants and Setting

Three residents living in independent supported living homes in Southwest Missouri participated in the present study. All participants were referred for this study by staff at the facility to address deficits in social communication. The agency offered vocational, medical, academic and behavioral services to individuals with developmental disabilities of all ages. Participant 1 was an 18-year old man diagnosed with Autism. Participant 2 was 21 years old and had a diagnosis of Autism, Attention Deficit Hyperactivity Disorder, and Mild Mental Retardation. Participant 3 was a 54-year old woman diagnosed with moderate intellectual disabilities. Training took place in an assessment room provided by a local treatment facility. The room was 3 x 3 meters and contained one table and three chairs. The room had one full length window with curtains beside the door.

Measures

Interobserver Agreement. The target conversation skills (greeting, initiate conversation, initiate a topic, turn-taking, and maintaining a topic) were defined operationally (see Appendix A) prior to data collection. Adaptations were made to both Nuernberger et al. (2013) and Kornacki et al.'s (2013) task analyses for training appropriate conversation skills. Experimenters recorded the occurrence, non-occurrence, or no opportunity for each step (Appendix A) on a printed copy of the data page that listed each step to have a conversation. This data was collected for each trial within the BST session and during each *in situ* measurement. Data was later converted to a

"percentage of steps demonstrated" as defined on the steps to having a conversation data page (see Appendix A). Interobserver agreement (IOA) was defined as two experimenters recording any agreement or disagreement of correct or incorrect skills demonstrated by the participant. Interobserver agreement was measured using two formulas tracking agreement on occurrence or nonoccurrence of the target behaviors. Each formula was calculated by dividing the total number of agreements by the total number of agreements plus disagreements. Experimenters averaged the results and multiplied by 100. IOA was recorded a minimum of one time across each phase and setting with each participant. The average percentage of total agreements throughout the study and across all participants totaled 96%. The average percentage of total disagreements throughout the study and across all participants was 24%.

Treatment integrity. Treatment integrity data was collected after each BST session. Integrity was monitored using a checklist (see Appendix B) describing each component of BST to ensure reliability of treatment implementation. For each step of the checklist, the trainer was to write "yes" (implementer used the skill), "no" (implementer did not use the skill), or "no opportunity" (implementer did not have an opportunity to use the skill).

Social Validity. After all BST sessions were completed, each participant answered four questions (see Appendix C) stating their opinions of the treatment and their feelings toward preparedness for future social interactions. Staff working with the clients were also asked to complete a survey regarding the treatment (see Appendix D). Staff answered the questions provided using a Likert scale.

Consent. The Institutional Review Board for Missouri State University granted approval for this study prior to receiving consent for participation. Informed consent (see Appendix E) for participation was granted by the parents of each participant. Each participant was provided a letter of assent (see Appendix F) prior to the initial training session.

Dependent Variables

Experimenters measured correct responding during a trial by successful demonstration of each of the eight steps on having a conversation. The percentage of correct steps performed during each trial was recorded during all sessions on a printed copy of the steps to have a conversation data page (Appendix A). Latency was recorded, by experimenters, for each participant to initiate a conversation at the beginning of each *in situ* trial. The experimenter started a timer when a confederate was within two meters of the participant. If the participant offered a greeting to the confederate before the specified proximity was reached, a timer was not started and the latency was recorded as zero seconds. The timer was stopped when the participant greeted the confederate. If the participant did not start a conversation after one minute, the experimenter provided a verbal prompt; “You should say hello” or “Do you know this person?”. If the participant did not initiate a conversation within four minutes, and the verbal prompts, the *in situ* session was ended. The time was documented on the bottom of the printed copy of the steps to have a conversation data page.

Paired-Stimulus Preference Assessment

If progress was not demonstrated during BST training, the participant received a paired-stimulus preference assessment. The results of the paired-stimulus preference assessment were used in order to incorporate preferred tangibles hypothesized to serve as reinforcement. Six items were selected for each participant. Items were selected based on guardian and participant verbal reports of preferred items. Each trial in the paired choice preference assessment consisted of the simultaneous presentation of two items. Each item was matched with against all other items in the set. The observer noted which item the participant chose. The items were ranked in terms of high, medium, and low preference based on how many times an item was chosen (Cooper, Heron, & Herold, 2007). If the participant demonstrated a decreasing trend during initial BST sessions, items selected during the preference assessment were available on a fixed-ratio (FR) schedule of reinforcement. The participant began with an FR1 schedule of reinforcement based on the steps for the having a conversation data page. Each FR schedule was individually increased based on each participant responding during the session. The participant had to exceed the previous highest number of correct steps demonstrated in order to access the preferred item until criterion was met (i.e., two trials with 100% correct responding).

Experimental Design

A non-concurrent multiple baseline design (Kazdin, 2010) across three participants and three settings was used in the current study. Participant 3 received an A-B design; consisting of the same Phase-B as Participant 1 and Participant 2. Participant 1

and Participant 2 participated in an A-B-C design consisting of two phases. Phase-B referred to the BST sessions with verbal praise serving as the reinforcement for improved performance. Phase-C was employed after both participants received a paired-choice preference assessment. While in Phase-C, each participant received access to their preferred item contingent on improved performance of the skills defined in the steps to have a conversation data page across trials within the BST session until 100% of the skills were demonstrated. Criterion was met if the participant correctly demonstrated 100% of the eight steps defined in the steps to have a conversation data page without prompting across two trials. When a participant exhibited stability or a decreasing trend during the baseline data collection, the first phase of the BST treatment was initiated. Treatment was initiated with each participant based on individual availability and stability of performance. Criteria for a successful BST session was defined as demonstrating skills in the steps to have a conversation at 100 % across two trials.

Procedure

One graduate student, under the supervision of a BCBA®, carried out all phases of the study. All components of the BST package (instructions, modeling, rehearsal, and feedback) were implemented during each session. All eight steps were targeted during each session.

Baseline. During baseline, the participant was alone with an unfamiliar confederate in the assessment room. The experimenter observed the participant and recorded any previously demonstrated conversation skills as defined on the steps to have a conversation data page. The participants were not given instructions to have a

conversation. The confederate was aware of the components of the study. Each confederate was given the instruction to not initiate a conversation with the participant but could respond if the participant spoke to them first. If a conversation was not initiated by the participant within four minutes, the baseline session was terminated.

Treatment. BST trials included instructions, modeling, rehearsal, and feedback. Multiple trials were conducted within one BST session. A task analysis was used to define the steps required to have a conversation. Each step was written consecutively on the steps to have a conversation data page. This data page was used to measure correct responding during all phases of this study. Each participant received BST to increase mastery of the following skills how to take turns in a conversation, offer a greeting, initiate a conversation, initiate a topic, and maintain a topic during a conversation. During the instructions component, each participant was provided with a copy of the steps of how to have a conversation data page. After the copy was provided, the experimenter read each step of how to have a conversation (see Appendix A). During the modeling component, the experimenter, along with a second experimenter, modeled having a conversation using each skill. Experimenter 1 said one of the greetings listed on the data page (i.e., hi, hello, hey) to Experimenter 2. Experimenter 2 replied with a common greeting. Experimenter 1 then initiated a conversation by asking one of the listed questions (i.e., how are you, What's new, are you having a good day). Experimenter 2 responded to the question. Experimenter 1 then stated a novel conversation topic (e.g., do you like this weather, did you watch the game, do you have plans today). Experimenter 2 responded to the question. Both experimenters exchanged statements until all eight steps had been modeled for the participant. The participant then rehearsed having a

conversation with an experimenter. If the participant did not perform 100% of the steps to having a conversation, corrective feedback was provided. Participant 1 and Participant 2 were provided access to preferred tangible items during Phase-C with each trial of improved performance. The participant continued to rehearse the target skills and receive feedback until 100% of the skills were performed for two consecutive trials. Feedback was delivered in the form of verbal praise for each correct response, and corrective verbal prompting was utilized for incorrect responses.

In situ. *In situ* sessions were employed in the participant's home, in the lobby of the facility housing the assessment room, and at the conclusion of each BST session in the assessment room. Following each BST session, the trainer left the room and a confederate unfamiliar to the participant entered the room. The experimenters stood outside of the room with the door open and recorded conversation skills demonstrated as defined by the steps to have a conversation data page. *In situ* in the home occurred one to two days following a BST session. *In situ* in the lobby occurred prior to a BST session, the receptionist served as the confederate. During *in situ*, the experimenter asked the participant to engage in a conversation. An unfamiliar confederate was present in each setting. Each confederate was instructed not to initiate conversation. Experimenters recorded conversation skills defined on a printed copy of the steps to have a conversation data page (Appendix A). If the participant did not engage in a conversation within four minutes after instructions were given, the *in situ* session was terminated. Experimenters recorded skills demonstrated by participants during conversations with individuals in the environment who were unaware of the study.

Maintenance/ Follow-Up

The experimenter conducted a maintenance phase that replicated the baseline sessions (i.e. no instructions or feedback provided) one to two weeks after the final BST treatment session. Follow-up probes assessments were conducted one month after the final BST training session and occurred for one session.

RESULTS

The results of baseline and BST sessions for each participant are shown in Figure 1. During the baseline phase, the mean percentage of correct steps for Participant 1 (top graph) had minimal variability but a decreasing trend was observed (mean = 8.33%; range = 0-25%). The average latency times for each participant across baseline and all *in situ* settings are displayed in Figure 2. Latency was recorded as zero seconds during the initial baseline session (see Table 1) for Participant 1. Subsequent baseline sessions were terminated due to the participant reaching the maximum allowed time (4 min.) and failure to complete any of the steps of having a conversation (mean = 160 seconds; range = 0-240 seconds). An immediate change in responding correctly was observed when BST was initiated. Following implementation of the BST session for Phase-B, the percentage of steps demonstrated correctly increased to a mean of 70 % (range = 25-100%) per trial; with moderate variability across the session averages, mean of 69 % (range = 61-82%). Table 2 displays the average number of trials for each BST session across all participants. Participant 1 had an average of seven trials per BST session for Phase-B (range = 4-10) and an average of 4 trials per session (range = 2-5) during Phase-C. The results for the social validity questions asked to the staff working with Participant 1 are found in Figure 3 (also see Table 3). Sour gummy worms were used as the preferred item for Participant 1 during Phase-C (see Figure 4). During Phase-C, the percentage of steps demonstrated increased to an average of 91% (range per trial = 50-100%; range for session average = 82.5-100%).

The results for the latency measurements across all participants are shown in Figure 2. The latency measurement (see Table 1) for Participant 1 during all *in situ* had a mean of 58 seconds (range = 0-225 seconds) with the lowest latency measured during the assessment room *in situ*. With that, Participant 1 demonstrated a 182 second decrease with latency to initiate a conversation from baseline. Participant 1's responding during *in situ* (Figure 1, top graph) had minimal variability from his responding during the BST sessions. Participant 1's average percentage of steps demonstrated across all *in situ* measurements was 70% (range = 50-88%). The mean percentage of steps demonstrated on the having a conversation data page across all *in situ* settings was as follows; lobby 63% (range = 63-88%), assessment room 63% (range = 50-88%), home 63% (range = 63-88%). During the maintenance phase, one week and one month after the final BST session, Participant 1 returned to baseline levels of responding (0%; 240 second latency).

During baseline, Participant 2 (Figure 1, middle graph) did not engage in any of the defined skills (mean = 0%; no range). Participant 2 had zero variability for latency to initiate a conversation. Each baseline session was terminated at the maximum allowed time (4 min.). Upon implementation of BST during Phase-B, Participant 2 had an average of 75% per trial (range 12.5-100%). His average demonstration of correct skills during Phase-B sessions was 76% (range 68-93%). Gummy Bears were selected by Participant 2 during the paired choice preference assessment as the most preferred item (see Figure 4). During Phase-C, Participant 2 demonstrated an average of 88% per trial (range = 62-100%) and average 88% during sessions (range = 83-100%) of the skills defined on having a conversation data page. Participant 2 had an average of 5 trials per BST session across Phase-B and an average of 8 trials during Phase-C. Participant 2's responding

during all *in situ* measurements is described in Figure 2, middle graph. Participant 2 had an average of 56% (range = 0-88%) and a latency average of 77 seconds (range = 0-240 seconds) across all *in situ* sessions. Therefore, demonstrating a 163 second decrease for initiating a conversation for Participant 2 from baseline (see Table 1) to *in situ*. During the maintenance phase, one week after final BST session, Participant 2 returned to baseline levels of responding (zero percent). The maintenance session was terminated due to the maximum allotted time (4 min). The second maintenance session, one month after the final BST session, Participant 2 engaged in 25% of the steps on the how to have a conversation data page. Latency during the one month maintenance session was 9-seconds.

Participant 3 engaged in stable responding (Figure 1, bottom graph) with zero variability during all baseline sessions (mean = 75%; no range). Conversations were initiated by Participant 3 with each confederate upon entering the assessment room. Latency was recorded as zero seconds during each baseline session (mean = 0 seconds; no range). After implementation of the BST sessions, Participant 3's percentage of correct responding was consistent with that of Participant 1 and Participant 2, an immediate increase was observed. Participant 3 had an average of 82% of skills correctly demonstrated per trial (range = 20-100%). Her average per session was 89% (range = 64-100%). In Figure 2, Participant 3's results displayed the *in situ* measurements. Participant 3 had the highest percentage of skill demonstrated while in the assessment room (mean = 83%; range = 33-100%). Participant 3 maintained a moderate percentage for correct responding across all *in situ* measurements (mean = 76%; range = 33-100%). Participant 3 had the lowest latency (see Table 1) to initiate a conversation during *in situ*

across all participants with an average of 12 seconds (range = 0-67 seconds). Participant 3 demonstrated a 25% increase from baseline for correct responding during her one week maintenance session (100%). Her latency measurement remained consistent with baseline sessions (zero seconds). During her one month maintenance session, she returned to baseline responding (75%) and latency was consistent.

The results of the social validity questions completed by staff members working directly with the participants are displayed in Figure 3. The staff working with Participant 1 reported they agreed with Questions 1 and 2 (see Table 3). They strongly agreed with Questions 3-5. Participant 1 self-reported that he did like the training sessions, he did feel better about talking with others, he is not sure if he would participate again in the future, and this did not help him talk to people he does not know. Participant 2 responded in agreeance with all of the social validity questions. The staff working with Participant 2 did not have an opinion of whether he gained skills from the treatment. Participant 2's staff also strongly disagreed that they have seen an increase in conversations or social interactions with Participant 2 sine the BST (Questions 3 and 5). The staff working with Participant 3 reported they agreed with Questions 1, 3, and 5. Staff working with Participant 3 strongly agreed that others can benefit from this treatment, and had no opinion on whether it was easier to participate in conversation with Participant 3 after the BST. Participant 3 responded "yes" to all social validity questions.

Results of the treatment integrity were recorded as 100% accuracy. This high percentage was consistent throughout the study and across all participants. Treatment integrity was only recorded on the primary investigator.

DISCUSSION

Experimenters in the current study successfully increased the use of conversation skills for three individuals with developmental disabilities during treatment and across three different settings while simultaneously decreasing the time (see Table 1) it took for Participant 1 and Participant 2 to initiate a conversation (baseline levels for Participant 3 were measured at zero seconds). The consistently high procedural fidelity and clearly outlined instructions and participant expectations probably contributed to the success during the procedures.

An increase in percentage of correct responding was found for conversation skills specified by the steps for how to have a conversation aligned with those of Nuernberger et al., (2013) and Kornacki et al. (2013) for skills recorded during the BST sessions and *in situ* sessions. Other results conclude a clear effect of the use of preferred items during behavior skills training on the percentage of skills demonstrated during the session. Unlike previous research using BST to teach conversation skills (Nuernberger et al., 2013; Kornacki et al., 2013), an increase in correct responding during conversation was demonstrated in the current study, the BST package is also effective in reducing the latency to initiate a conversation across multiple settings.

The results of the maintenance phase for Participant 1 and Participant 2 were inconsistent with that of previous research. Both participants returned to baseline levels of responding during the maintenance session. Experimenters experienced difficulty with maintaining consistent weekly appointments with each participant. Due to limited scheduling availability of the participants and the experimenter, sessions were conducted

only once per week. Experimenters hypothesize this could have had an effect on the acquisition rate and level of correct responding for Participant 1 and Participant 2. Participants from Nuernberger (2013) study received BST sessions one to five times per week. This significant difference in number of sessions per week across studies is hypothesized to also have contributed to the inconsistent results during the maintenance phase from Nuernberger to the current study. Future research should investigate the usefulness of more training sessions each week on skill acquisition. Limited number of training sessions could influence rate of correct responding during sessions, as well as during the maintenance phase.

Due to limited availability of confederates, this study did not exclusively use same age peers as confederates during the *in situ* measurements for the participants. Therefore, the *in situ* measurements could have more accurately reflected a typical social environment if confederates were selected based on age.

The current study did not measure nonverbal skills associated with having a conversation. Participant 2 would look down or cover his face with a sleeve or jacket during the rehearsal component of the BST package and *in situ* measurements while also maintaining a high percentage of responding based on the steps of having a conversation. Verbal prompting was utilized for Participant 2 to maintain contact but no data was collected on the eye contact or prompting levels. Future research should incorporate additional nonverbal skills (i.e., eye contact, posture, hand gestures).

Each participant was given their choice of topic to discuss during conversations with confederates and during the session. Each participant began using the same or similar topic for initiation. This often resulted in limited responding for the confederate.

Participant 1 asked several confederates “Do you need a nap?”, Participant 2 asked most confederates about religious related topics such as “Do you know Jesus?”, “Who was Jesus’s mother?” and “Who lives in heaven?”. Participant 3 asked most confederates about their clothes or jewelry. During sessions, experimenters suggested neutral topics for initiation (i.e. “Do you like this weather?” or “What are you doing this weekend?”) for rehearsal during the BST sessions.

Previous research was conducted with a limited age group of individuals with developmental disabilities across ages between 19-23 years old (Nuernberger et al., 2013; Kornacki et al., 2013). The broad diversity across the participants in the current study support the conclusion that the methods described can be implemented across individuals of numerous ages with or without developmental disabilities. Unlike previous research, these results also support generality of the acquired skills across many environments. Previously *in situ* was measured exclusively in the participant’s home following a BST session (Nuernberger et al., 2013). The results of this study concluded the participants were able to successfully demonstrate appropriate conversation skills measured with the steps of having a conversation across three settings. Future research should investigate novel locations for an expansion of location generality.

During this study, the same receptionist served as the confederate during the *in situ* measurements that took place in the lobby. Increased responding across all participants while in the lobby could be due to the increased exposure to the same confederate. An analysis of repeated exposure to the same and different confederates is recommended for future research.

Participant 3's responding during *in situ* sessions was variable. Experimenters reported an increase in responding when Participant 3 was exposed to female confederates. Data was not recorded on confederate gender, therefore the significance of this hypothesis cannot be determined with the current study. Future research should assess gender as it relates to conversation skills.

Future research should also consider the use of *in situ* training. Miltenberger et al. (2009) used *in situ* training for teaching safety skills to children in a school setting. The *in situ* training the experimenters used involved experimenters presenting themselves in the *in situ* environment and modeling and rehearsing the safety skills used during the BST sessions. This strategy could be useful for the *in situ* probes in future replications of this study.

In order to better facilitate maintenance of skills, researchers suggest future replications of this study should analyze transferring stimulus control in a structured manner. One suggestion might be to use multiple trainers for the BST and have BST sessions within multiple environments.

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Table 1. Average Latency Measurements Across Participants and Settings (seconds)

Measurement	Participant 1	Participant 2	Participant 3
Baseline	160	240	0
Assessment Room	56	70	3
Lobby	114	67	0
Home	102	185	24

Table 2. Number of Trials per Session

	Participant 1	Participant 2	Participant 3
BST Session 1	4	6	3
BST Session 2	8	6	6
BST Session 3	6	5	2
BST Session 4	10	4	2
BST Session 5	5	5	5
BST Session 6	2	11	N/A
Average Number of Trials	6	6	3.6

Table 3. Responses to Social Validity Questions Completed by Staff

Question	Participant 1	Participant 2	Participant 3
1. The Participant gained skills from treatment	4	3	4
2. It is easier to participate in conversation with the participant	4	2	3
3. I have noticed the participant engaging in more conversations since treatment	5	1	4
4. I think other individuals would benefit from this treatment	5	5	5
5. There has been an increase in social interactions since the treatment	5	1	4

Note. Staff responded to social validity questions using a Likert scale of one to five; 1= strongly disagree; 5= strongly agree. Each participant received one rating.

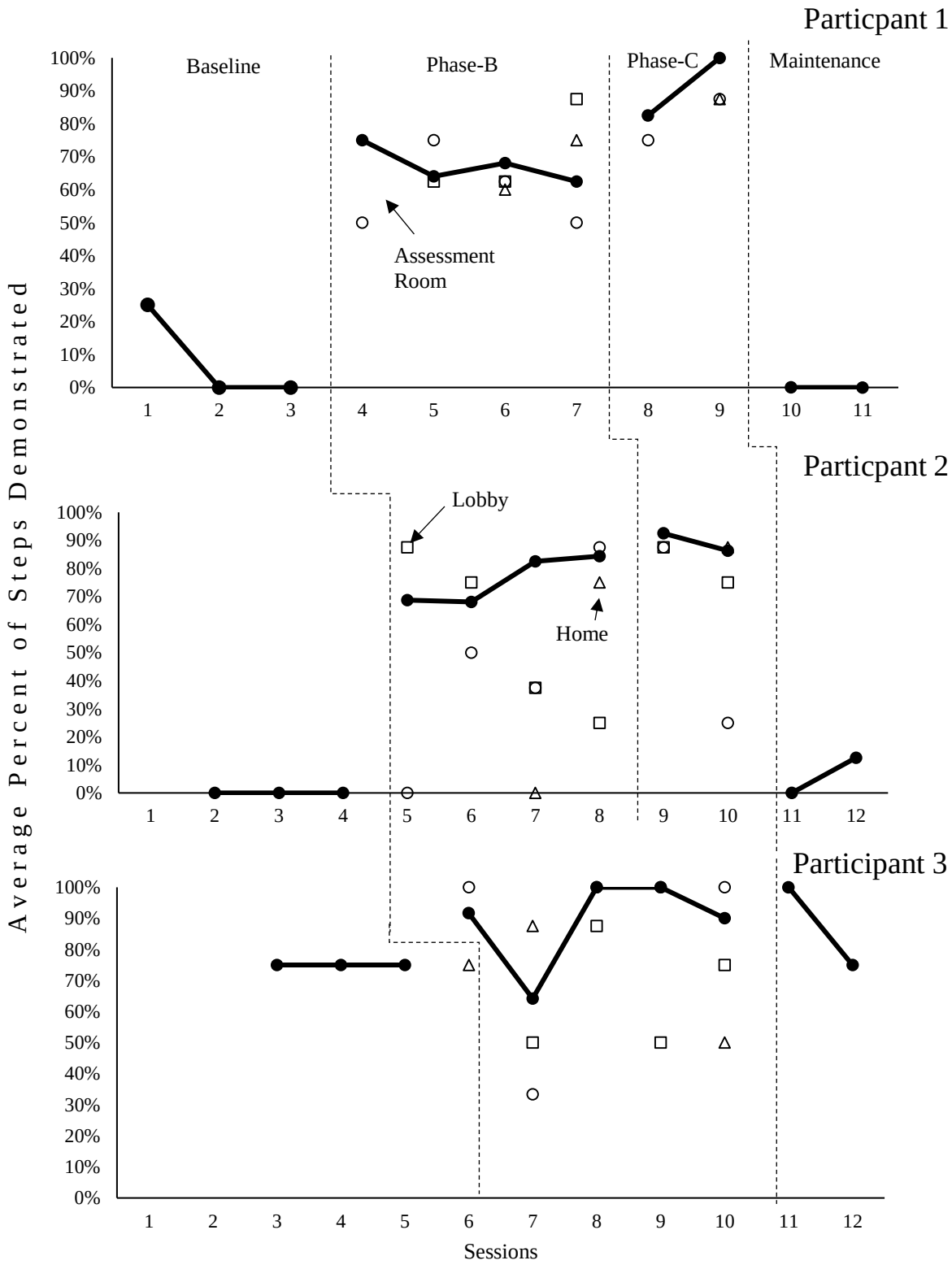
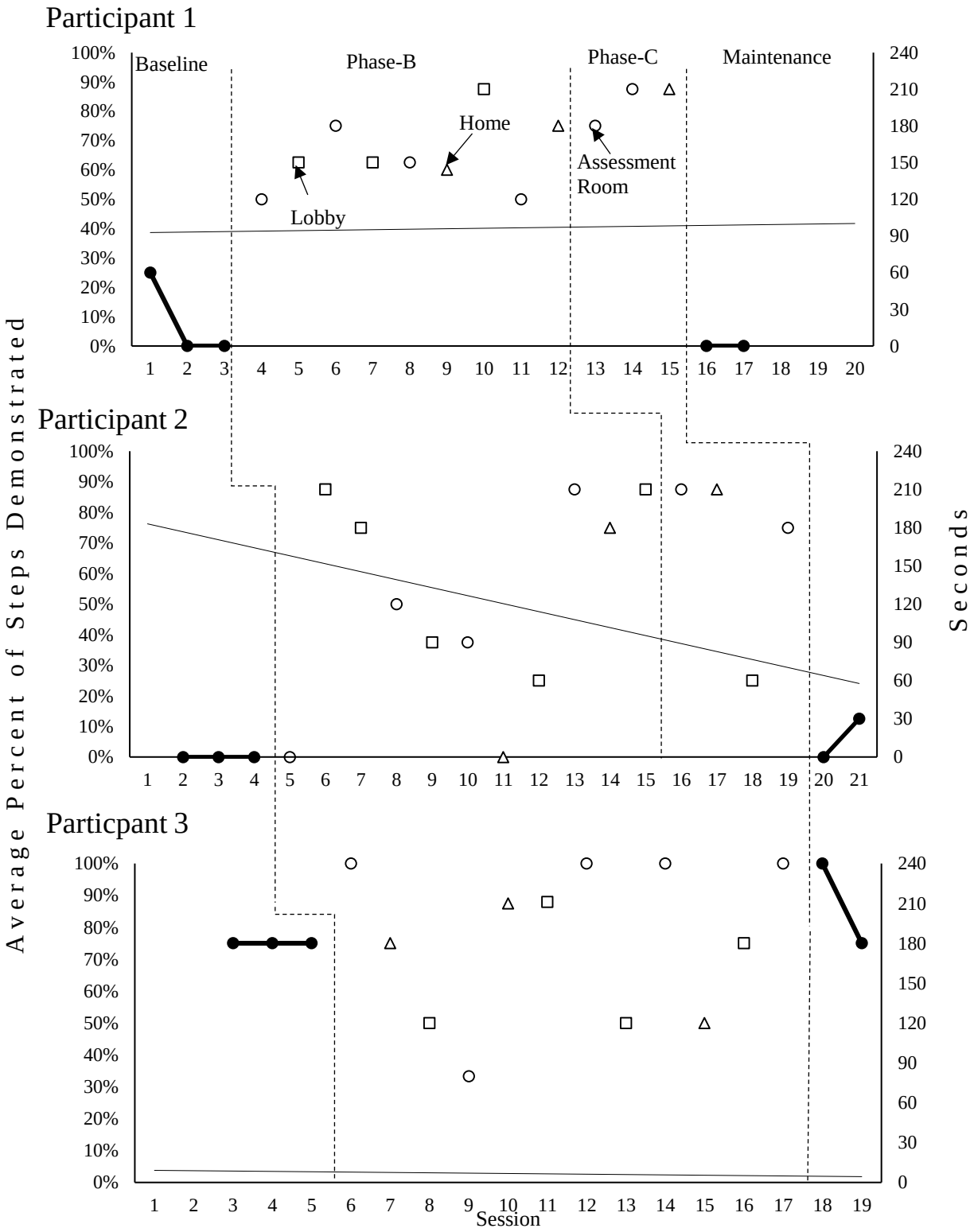


Figure 1. Average Percent of Steps Demonstrated Across Participants



Note: Linear trendlines are used to clarify results of latency measurements.

Figure 2. Latency Measurements Across Participants and Settings

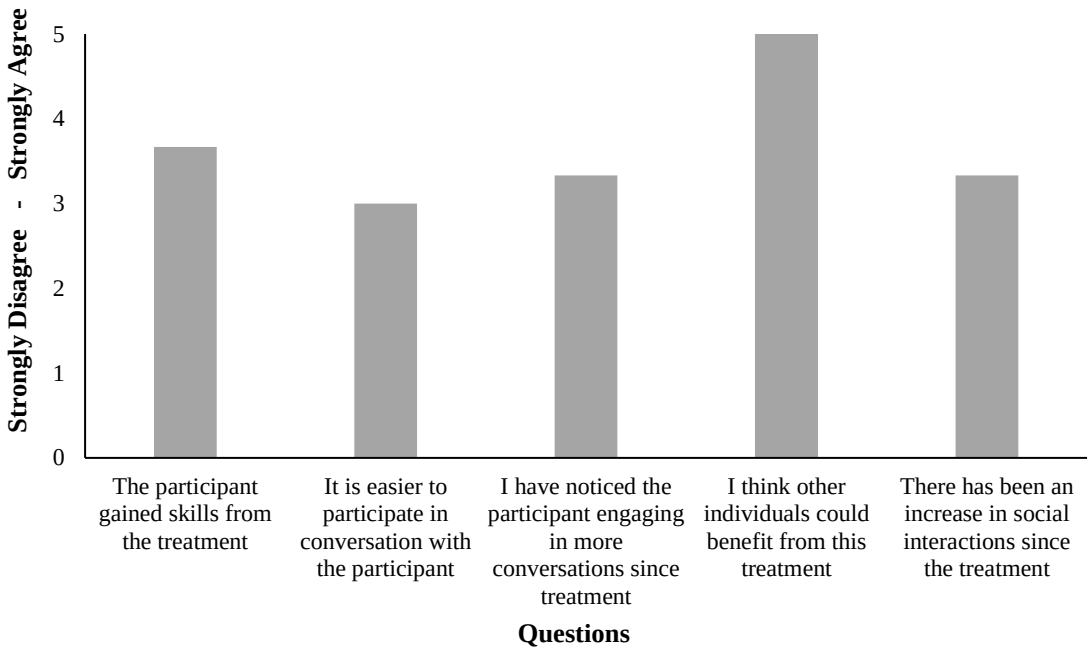
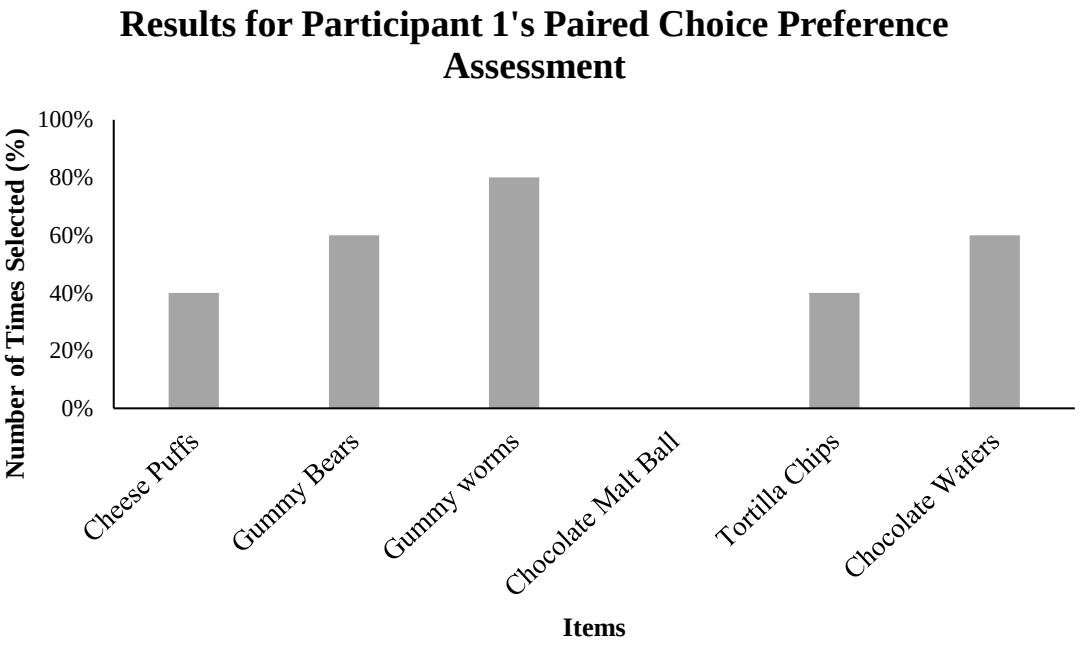


Figure 3. Average Response for Social Validity Questions for Staff



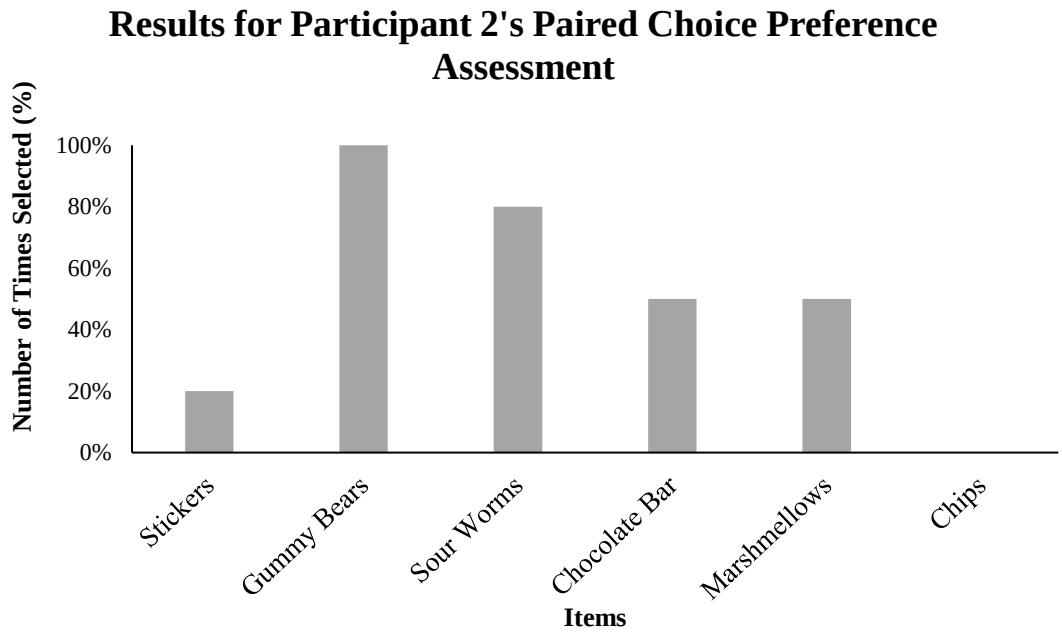


Figure 4. Results for Paired Choice Preference Assessments

APPENDICES

Appendix A. Steps to Have a Conversation Data Page

Step	Description	Definition	Step Demonstrated Correctly
1	Greeting	Participant offers a greeting prior to engaging in conversation. (example: “Hello”, “Hi”, “Hey”)	
2	Initiation	Participant must say one of the learned phrases listed below or a phrase similar for initiating conversation; "How are you?”; “What’s new?”; “Are you having a good day?”	
3	Initiate Topic	Participant says a statement or question on a specific topic.	
4	Turn taking	Participant does not speak for 3 consecutive seconds, does not interrupt the speaker. The participant did not engage in nonverbal behaviors that interrupted the speaker.	
5	Maintain topic/ responding	The participant says a phrase or statement in response to the speaker. The statement must address the topic being discussed. The response must be spoken within 30 seconds to meet criteria.	
6	Turn taking	Participant does not speak for 3 consecutive seconds, does not interrupt the speaker. The participant did not engage in nonverbal behaviors that interrupted the speaker.	
7	Maintain topic/ responding	The participant says a phrase or statement in response to the speaker. The statement must address the topic being discussed.	
8	Turn taking	Participant does not speak for 3 consecutive seconds, does not interrupt the speaker. The participant did not engage in nonverbal behaviors that interrupted the speaker.	

Total steps demonstrated correctly: _____/8= _____%

Appendix B. Treatment Integrity Checklist

Implementer Skill	Record "yes", "no", or "no opportunity"
1. Implementer showed written steps to have a conversation to participant	
2. Implementer read each step and explained each step to participant	
3. Implementer modeled how to initiate a conversation	
4. Implementer modeled waiting for a turn to speak	
5. Implementer modeled how to maintain a topic	
6. Implementer rehearsed how to initiate a conversation for the participant	
7. Implementer rehearsed how to wait for a turn to speak for the participant	
8. Implementer rehearsed how to maintain a topic (i.e. providing phrases) for the participant.	
9. Implementer provided 1-2 sentences of verbal feedback to participant	

Appendix C. Social Validity Questions for Participants

1. Did you like the training sessions?
2. Do you feel better about talking with others?
3. Would you participate again in the future?
4. Do you think our sessions have helped you talk to people you do not know?

Appendix D. Social Validity Questionnaire for Staff

1. The participant gained skills from the treatment.

(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

2. It is easier to participate in conversation with the participant.

(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

3. I have noticed the participant engaging in more conversations since treatment.

(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

4. I think other individuals could benefit from this treatment.

(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

5. There has been an increase in social interactions since the treatment.

(Strongly Disagree) 1 2 3 4 5 (Strongly Agree)

Appendix E. Missouri State University Consent Form

Dr. Michael C. Clayton (Principle investigator and faculty advisor) and Allison Schmidt (Graduate Student) has requested _____'s participation in a research study with Missouri State University.
The purpose of the research is to use Behavior Skills Training (BST) to teach and increase the existing conversation skills.
Participation will involve participating with the BST procedures, which includes 4 conditions; instruction, modeling, rehearsal, and feedback. Each condition is expected to last 30-45 minutes. Conditions will only be repeated as necessary. These sessions will target the following skills; initiating conversation, turn-taking (defined as waiting and avoiding interrupting the speaker. and maintaining a topic.
There are no foreseeable risks or discomforts if agreement is made to participate in this study.The possible benefits of participation in this research study are an increase in conversation skills that are beneficial to quality of life. An increase in these targeted skills will be beneficial as an individual, and to those he/she is in contact with (family, staff, professionals, members of society).

The results of this research study may be published but all names and/or identity will not be revealed. The researcher will do the following to maintain confidentiality of records. Allison Schmidt will use a pseudo name in the written study. Access to confidential and private documents containing identifiable information will be destroyed at the conclusion of this study. information in regards to this study will be strictly provided to Dr. Clayton, Allison Schmidt, and approved Arc of the Ozarks staff members.

Any questions you may have concerning the research study or participation will be answered by Dr. Michael C. Clayton (principle investigator) or Allison Schmidt (Graduate Student)

This research has been reviewed and approved by the MSU Institutional Review Board. If I have questions about rights as a subject/participant in this research, or if I feel _____ has been placed at risk, I can contact the Chair of the Institutional Review Board.

The nature, demands, benefits and any risk of the project have been explained to me. I knowingly assume any risks involved.

I have read the above informed consent form. I understand that participation is voluntary. There will not be payment for participation. Participation and/or withdrawal from the study will not effect and treatment or care currently being received. I may withdraw my consent and discontinue participation at any time without penalty or loss of benefits to which I may otherwise be entitled. In signing this consent form, I am not waiving any legal claims, rights or remedies. A copy of this consent form will be given (offered) to me.

Appendix F. Participant Letter of Assent

If you want to talk to the person doing the study (Allison) by yourself, please ask. This form may contain words you do not understand. Please ask the Allison or staff to explain anything you do not understand.

What is this research study about?

You are being asked to be in a research study. This research study will test a new way to teach called behavior skills training (BST) that may help your conversation skills.

What will happen during this study?

If you want to be in this study, you will come to the Arc of the Ozarks office. You will come to the office 1 time a week. You, Allison, and an assistant will have short meetings. During these meetings, Allison will give you written instructions on how have a conversation. She will also explain how to have a conversation. After Allison gives the instructions, she and her assistant will show you what a conversation should look like. Then you will get a chance to practice a conversation with Allison. Then you and Allison will talk about how you did practicing having a conversation. There will be times that Allison will ask you to have a conversation with someone else.

Will you feel uncomfortable during this study?

Sometimes talking to new people can feel scary. Allison wants you to feel comfortable talking to new people. Be sure to tell Allison or staff if you are feeling scared or uncomfortable while you are in this study.

Do you have to be in this study?

No. Being in this study is your choice and the choice of your guardians or parents. If you do not want to be in this study it is okay and no one will be angry at you because of that.

ASSENT STATEMENT

You will not be in this study unless you want to be. If you agree to be in this study, you are saying these things:

- You have read this form or it have been explained to you
- You have asked all the questions you want to ask. You can ask more questions at anytime
- You have talked with your guardian or parents about this study, and you want to be in it
- You know that you can quit the study at any time and you won't get in trouble

If you want to be in the research study, tell Allison or staff. If you don't want to do this, it's okay to say no. If you say no, you will continue your usual care.

I agree to be in the research study and I know that I can stop being in the study if I want to.

I have read this paper or have had it read to me. I understand what I have to do in this study, and I agree to take part in it.