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Initiating Conversation by a Kindergarten-Aged Child with Autism Spectrum Disorder

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Initiating Conversation by a Kindergarten-Aged Child with Autism Spectrum Disorder

An Honors Program Project Presented to
the Faculty of the Undergraduate
College of Health and Behavioral Studies
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by Eliana Segal

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Accepted by the faculty of the Department of Psychology, James Madison University, in partial fulfillment of the requirements for the Honors Program. Pensive

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Abstract

Children with Autism Spectrum Disorder (ASD) have social skill deficits that are often manifested in a failure to achieve normal back-and-forth conversation. They rarely initiate social interactions and often show little responsiveness to others. This can extinguish the social initiations of their peers, leading to great difficulty making friends. The purpose of the present study was to teach a child with ASD at an inter-professional autism clinic how to initiate and reciprocate a social conversation. A prompt fading procedure was implemented during training sessions to build a set of social skills into the child's repertoire. The intervention provided social attention and positive touch as consequences for the appropriate social skills. This intervention was implemented sequentially in a multiple-baseline across behaviors design. During intervention phases, the participant generalized the trained social greeting to five student clinicians who were not involved in training.

Initiating Conversation by a Kindergarten-Aged Child with Autism Spectrum Disorder

The fundamental component of Autism Spectrum Disorder (ASD) is extreme social withdrawal (Gaylord-Ross, Haring, Breen, & Pitts-Conway, 1984). Children with ASD exhibit asocial traits including a desire to be alone, rigid adherence to structure of schedules, disinterest in others, and perseveration on irrelevant objects or topics (Kamps, Leonard, Vernon, Dugan, & Delquadri, 1992). The characteristic social-skill deficits of ASD are present early in development, and are often manifested through a failure to achieve normal back-and-forth conversation, abnormalities in eye contact and body language, and deficits in understanding gestures (American Psychiatric Association, 2013). Children with ASD rarely initiate social interactions, and show very little social reciprocity (Odom & Strain, 1986). This lack of responsiveness to social interaction often extinguishes peer initiations (Odom & Strain, 1986). These factors, as well as deficits in adapting behavior to fit a given situation, contribute to difficulties making friends (American Psychiatric Association, 2013).

Lovaas, Kogel, Simmons, and Long (1973) investigated the treatment effects of behavioral therapy in 20 children with ASD in terms of treatment, response generalization, and maintenance of therapeutic effects. They found a decrease in inappropriate behaviors (especially self-destructive behaviors), an increase in appropriate behaviors, the emergence of spontaneous language and social interaction, and improvements in intelligence and social assessment scores (1973). Therapeutic effects were maintained in 1- to 4-year follow-up measures in children whose parents were trained in behavioral therapy, and those who were not could temporarily regain some of the therapeutic improvements if they briefly resumed therapy.

Another study examined how the intensity of a 2-year behavioral treatment affected the educational and intellectual functioning of 19 children with ASD who were less than 46 months

old (Lovaas, 1987). The researchers hypothesized that their treatment would allow some of the children to catch up with their peers by first grade. The experimental group received more than 40 hours of treatment per week and the control group received 10 hours, or fewer, of treatment per week. The treatment involved separate programs for each goal behavior. The experimental group had more children achieve normal intellectual and educational functioning by first grade than the control group, and fewer children identified as retarded by first grade, compared to the control group.

McEachin, Smith, and Lovaas (1993) performed a follow-up study when the participants were 6 to 19 years old and had been out of treatment for 0 to 12 years, to evaluate their intellectual, social, and emotional functioning. Participants in the experimental group maintained their level of intellectual functioning from their first-grade assessments, which were higher than those of the control group. The experimental group showed more adaptive and fewer maladaptive behaviors than the control group. These results indicated that the repetition and intensity of the treatment implemented in the original study within a structured setting were critical components of the maintenance of social skills in children with ASD.

Stokes, Baer, and Jackson (1974) implemented principles of behavioral therapy to develop an initiating social greeting response in the form of a hand wave in four children and adolescents with Intellectual Disability living at a state institution. A multiple-baseline design across participants showed that the interventions applied in the study were successful in the developing the greeting response in all participants. Stokes et al. (1974) also studied the use of additional trainers to promote generalization of the greeting responses. They found that the use of an additional trainer promoted high levels of generalization of the greeting response to other staff members in the institution.

With the empirical success demonstrated by Lovaas and his contemporaries in the use of behavioral therapy for the treatment of several maladaptive behaviors common among children with ASD, the use of behavioral therapy with this population became widespread. Through the use of an alternating treatment design, Odom and Strain (1986) compared a peer-initiation procedure to a teacher-antecedent procedure for the improvement of the social interaction of children with ASD. The primary goal behaviors were play organization and sharing. A token reinforcement system was implemented during the interventions. The peer-initiation procedure showed an increase in social responses and the teacher-antecedent procedure showed an increase in both initiations and responses.

Kamps et al. (1992) used a multiple baseline across subjects design to study the use of social skills groups to facilitate increased social interaction for students with ASD and their typically developing peers. Students were trained in the initiation of, responding to, and continuity of social interactions, as well as accepting compliments and asking for help, among other skills. Results showed increases in frequency and duration of social interactions and were maintained during a one-month follow-up. The researchers suggested that the focus on fewer behaviors than previous studies allowed for more practice and was an efficient approach because it was more manageable for the children with ASD.

More recent research has studied the use of social skills groups to teach social behaviors to children with ASD. Kroeger, Schultz, and Newsom (2006) compared social skills groups for children between four and six years of age. One group used direct teaching and the other used unstructured play. The researchers found increases in social behaviors of both groups, but greater improvements in the social skills of the direct teaching group. Target behaviors (parallel play, ball play, joint play, and pretend play) were introduced successively over the course of four

weeks. Verbal praise was delivered for eye contact, smiling, and interactive play throughout the study. The authors noted that the 2 to 1 student to facilitator ratio contributed to the social improvements of the children in the study.

Leaf et al. (2008) used a multiple baseline design across skills design to show the effectiveness of a procedure for teaching social skills to three children with ASD in increasing conversation and play with peers with ASD. The procedure included stating the target behaviors to the learners, dividing the social skill into smaller components, providing rationales for why the child should engage in the target behavior, teacher demonstrations, role-play, and feedback. The participants were reinforced through the use of a token economy throughout the study. Target social skills were divided into play, language, and emotional skills, as well as choosing the same peer with whom to play throughout the day. The participants increased their amount of play and communication with peers after the intervention.

The present study applied previous behavioral therapy techniques for teaching social skills to a kindergarten-aged child with ASD. The primary goals of this study were to teach appropriate initiation and reciprocity of a social interaction. The social skills training was implemented into the participant's weekly behavioral therapy. The researcher expected to see an increase in the frequency of appropriate social interactions with graduate and undergraduate Psychology student clinicians. The study will potentially produce benefits in the interactions between the child and the clinicians with whom he works.

Method

Participants

The participant of the current study was a boy aged 5.5 years with a diagnosis of ASD who attended weekly treatment sessions. Prior to this study, assessment by a licensed Speech-Language pathologist and licensed Clinical Psychologist concluded showed an expressive and receptive language delay that is not appropriate for his chronological age, secondary to ASD. The child had tendency to use avoidance behaviors when not interested in the task at hand, such as staring off in the distance, throwing objects, rolling around on the floor, looking out the window, or getting up and walking around the room. Also prior to this study, the participant participated in an assessment using the *Autism Diagnostic Observation Schedule –Second Edition* (ADOS-2), Module 1. His total comparison score fell in the moderate range of autism-related symptoms when compared to others with similar expressive language, and he showed several social and communication improvements from assessment the previous year. At the beginning of the assessment, he smiled at the examiner and made attempts to maintain the examiner’s attention. He stood next to her and pointed at items in a book while he counted. He used eye gaze and initiation of joint attention to communicate his enjoyment. During the assessment, the child generally used single words to communicate but at times used two- and three-word utterances. He spontaneously directed some of his vocalizations to others to make requests such as “juice”, “goldfish” and “please” during snack. His vocalizations were mostly labels (tacts) of objects in his environment or requests (mands). For example, he requested “more bubbles please” during an activity. At the start of the present study, he was physically able to transition between therapy sessions, but his repertoire of elopement behaviors required that an adult hold his hand so that he could transition successfully. Prior to the present study, the

participant could say initiate a conversation by saying “hi”, but often did so at inappropriate times. For example, he would say hi to a data collector during a therapy session to escape from the demands of therapy and recruit attention. The authors had not heard the child show social reciprocity in the context of a conversation.

Procedure

Setting. Research was conducted at the Inter-Professional Autism Clinic (IPAC) at the Occupational Therapy Clinical Education Services Clinic at James Madison University. The clinic is a service, training and research program operated through the Baird Center at the Institute for Innovation in Health and Human Services in the College of Health and Behavioral Studies. IPAC consists of a sensorimotor gym used for child-centered play with gymnastics mats covering the floor, a ball pit, and swings. There was an open area with a tent and a small track, on which gross motor activities were conducted. Speech therapy sessions were typically conducted in a small area separated by temporary wall dividers with a round table and chairs. This area was also used by graduate student therapists in Occupational Therapy to work on fine motor skills through arts and crafts. In the room next to the speech therapy area, there was a small table and chairs used by undergraduate and graduate student therapists in Behavior Analysis to teach and reinforce essential school skills.

Coding and inter-observer agreement. Frequency of social interaction was coded by response per opportunity. Observers marked on a data sheet whether or not each step of the social interaction occurred. These steps were: a clinician approached the child, the child initiated social interaction, a clinician asked “How are you?”, the child responded “Good”. In the seventh session, a fifth measure, whether the child asked “How are you?”, was added. The number of responses (i.e., social initiations or responses) were divided by the number of response

opportunities (i.e., clinician approach or “How are you?”), and that number was multiplied by 100 to determine how often the participant responded when given the opportunity. Inter-observer agreement (IOA) was assessed by conducting two observations concurrently during at least 30% of the probes in each phase of the study. IOA was calculated by multiplying the total number of probes during which two observations were conducted concurrently by four for the first six sessions and by five for the remaining sessions. The number of steps on which the two observers agreed was divided by that number and multiplied by 100. IOA ranged from 80% to 100% throughout the study, with an average of 97.75%.

Experimental Design. A single-subject multiple-baseline across behaviors design was used. The study consisted of baseline, training, and intervention phases. In the baseline phases, data on the participant’s pre-intervention rates of social initiation and reciprocation were recorded. The training phases helped the participant to implement social-skill goals of initiation, and then reciprocation of a social interaction. In the intervention phases, positive social attention and positive touch were presented systematically as positive consequences, and rates of social initiation and reciprocation were recorded. Social initiation behavior was defined as saying the word “hi” within 5 seconds of a student clinician approaching the child. Social reciprocation behavior was defined as the child responding to, “How are you?” by replying, “Good, how are you?”. Observations of the interactions between the participant and undergraduate or graduate student clinicians were coded during transitions to and from work and play. The work-play rotation was the structure of the therapy schedule; when it is time for one of their therapies, the children were told that it is time to work, and when they take a break between therapies, they play. Interactions were also observed during transitions to and from different therapy sessions (e.g., occupational therapy to speech therapy). The study consisted of a total of 14 sessions over

the course of 5 months. One session was defined as one 3-hour inter-professional therapy period at the clinic. An average of 9.57 observations were taken during each of the 14 sessions, totaling over 1,800 observations. At various times during each session, licensed and student clinicians approached the participant as a normal part of the routine. If the child initiated a conversation under these circumstances, he was still provided with positive social attention but these initiations were not recorded.

Social initiation baseline. Student clinicians approached the child and positioned themselves at a small distance from the child – a distance that would typically evoke a verbal response in a neurotypical child. The student clinician stayed in that position for 5 seconds before returning to a more socially appropriate distance from the child. If the child said “hi” during those 5 seconds, that initiation behavior was recorded on a data sheet. Student clinicians approached the child an average of 8.25 times per session during the initial baseline phase of the study. This meant that they completed 33 of the 40 approaches requested, for an efficiency score of 82.5% (Stokes et al., 1974).

Social initiation training. After a low, stable rate of social initiation responses was established under baseline conditions, training for social initiation began. An undergraduate student clinician and the licensed supervising clinician conducted two 5-minute training sessions in an enclosed room. The use of a second trainer has been shown to promote greater generalization of a social greeting response to other adults who are not involved in training (Stokes et al., 1974). In the beginning of the first session, the child was given a brief verbal description of what would happen during the session. During the training sessions, a clinician approached and stood at approximately the same distance from the child as during baseline. The clinician stayed in that position for 5 seconds. If the 5 seconds elapsed without a social initiation

from the child, the clinician gave the prompt, “Say hi” and waited another 5 seconds for the child to comply. If the child complied within the 5 seconds, the clinician responded to his initiation of the social interaction and delivered positive social attention, labeled verbal praise, and positive touch. If the child did not say “hi” after 5 seconds, the clinician returned to a more socially appropriate distance from the child. Prompts were gradually faded from “Say hi” to “Say”, and then decreased in frequency as the child’s social initiation behavior came under the control of the adult approaching him. Ten probes were conducted by each trainer during each training session, for a total of 20 probes per session. During the first training session, the child initiated a social interaction without prompting during 69.23% of the probes by the licensed clinician and during 37.5% of the probes by the student clinician. During the second training, the child initiated a social interaction during 100% of the probes with both trainers.

Social initiation intervention and social reciprocation baseline. The initial baseline conditions were reinstated. If the child said “hi” within 5 seconds of a student clinician’s approach, the clinician delivered positive social attention and positive touch, and then asked the child, “How are you?”. If the child did not say “hi” within 5 seconds of the clinician’s approach, the clinician gave the prompt, “Say hi”. If the child complied with the prompt within 5 seconds, the clinician delivered positive social attention and positive touch, and then asked the child, “How are you?”. If the child did not comply with the prompt within 5 seconds, the interaction ended. If the child provided an appropriate verbal reply to the question “How are you?” within 5 seconds, the student clinician immediately reflected the response, and the behavior was recorded on a data sheet. The clinician then waited another 5 seconds before ending the interaction to give the child an opportunity to reciprocate by asking the question, “How are you?”.

Social reciprocation training. After a low, stable rate of social reciprocation was established under baseline conditions, training for social reciprocation began. An undergraduate student clinician and the licensed supervising clinician conducted one 10-minute training session in an enclosed room. During this first session, the trainers used a verbal prompt, “Say, how are you” and modeled the correct back-and-forth social interaction for the child. These procedures were not effective in training the child to ask “How are you?” after responding to the same question. Due to the complexity of this skill the duration of training was increased to 45 minutes and a third trainer was used. The third trainer was also an undergraduate student clinician in the clinic at which the study was conducted. In the second training session, a backward chaining procedure was implemented in order to teach the child the complete back-and-forth social interaction. Positive touch and social attention were delivered systematically after each correct response made during training. First, the last step of the interaction, the child asking “How are you?”, was taught by using the prompt, “Say how are you”. The child first responded by imitating the word “you”. The trainer then gave the prompt, “how” to which the child responded “are you”. After, the trainer returned to the prompt “Say how are you” and the child was able to respond appropriately. Once the child consistently correctly asked the question, the second-to-last verbalization in the sequence, “Good, how are you?” was added and trained. Trainers asked the child, “How are you?”. Trainers gave the prompt, “Say good, how are you”. This prompt was then changed to “Say good, how” to which the child responded “how are you”. After, the prompt was faded to “Say good” with only the first phoneme in the word “how” to which the child responded, “Good, how are you?”. However, this response did not occur at rate that would suggest that the complete response was in the child’s repertoire. Therefore, a third training session, lasting 33 minutes, was conducted by the same three trainers. The third training session

contained 60 probes, and continued the backward training procedure where the previous training session left off. Training procedures briefly switched to forward chaining and then returned to backward chaining. The child correctly responded “Good, how are you?” with some prompting during 23 of the 60 training probes, or 38.33%. The child required a prompt for both steps in the sequence (“Say good” and “Say how are you”) during 47.83% of the 23 probes. During 43.48% of the 23 probes, the child required a prompt for only the first part of the sequence (“Say good”), but said, “How are you?” independently. Finally, during 8.7% of the 23 probes, the child required a prompt for only the second part of the sequence (“Say how are you”), but replied “Good” independently. These data show improvements from the previous training sessions, but not proficient skill development.

Social reciprocation intervention. Because the child did not reach proficiency during training, probes during the intervention phase were conducted only by the two student trainers, not the five additional student clinicians. Social reciprocation baseline conditions were reinstated. If the child replied to the question “How are you?” by saying, “Good, how are you?” within 5 seconds, the clinician immediately responded, “Good!”, delivering positive social attention and positive touch. If the child did not respond correctly, the clinician prompted, “Say g-”. If the child responded correctly within 5 seconds of the delivery of the prompt, the clinician immediately responded, “Good!”, delivering positive social attention and positive touch. If the child only responded, “Good”, the clinician prompted, “Say how are you”.

Results

The present study examined the effectiveness and generalization of a social skills intervention through a multiple baseline across behaviors design. Figure 1 represents the baseline and intervention data for the child’s initiation of a social interaction, defined as saying “hi”

within 5 seconds of a student clinician's approach, and baseline data for the child's reciprocation within a social interaction, defined as the child responding "Good, how are you?" to a student clinician asking, "How are you?". Data are presented as the percentage of correct responses the child made out of the total number of opportunities the child had to respond in each session. Baseline data for social reciprocation were not collected during the first four sessions because reciprocation was contingent upon initiation. As the child did not initiate any social interactions during baseline, he did not have the opportunity to reciprocate.

Data were analyzed using visual analysis of variability or stability of trend and the level within the data path. The multiple baseline design shows that after the social initiation training occurred, the child was able to initiate social interactions. Baseline observations were made during four sessions that occurred prior to training. Social initiation changed from a low stable baseline ($M = 0\%$) to high proficiency during the intervention phase with the trainer ($M = 100\%$). The child also generalized the social initiation behavior to five other student clinicians ($M = 86\%$). We refer to these five clinicians as the "probers". In session 5, the child initiated independently with the probers in 12.50% of the observations. In four of the observations during which he did not initiate independently, he was given a verbal prompt ("Say hi") and complied with the prompt. In sessions 9 and 14, the child initiated independently with the probers during all but one observation. In those observation, he complied with the prompt, "Say hi". In sessions 10 through 13, the child initiated social interactions with both the trainer and the other student clinicians at a high, stable level ($M = 100\%$). Baseline reciprocation responses occurred at a low, stable rate ($M = 0\%$). In the first session after training (session 13), the child reciprocated with the correct sequence, "Good, how are you" after being given Prompt 1 ("say g-") during 44.44% of probes. The child correctly reciprocated with two separate prompts, Prompt 2, ("say g-" and

“say how are you”) during 55.56% of probes. The child reciprocated with the correct sequence with Prompt 1 in 20% of the first five probes of session 13. In the next five probes, this increased to 40%. In the five subsequent probes, the percentage further increased to 60%. The child reciprocated with the correct sequence during 66.67% of the final three probes of the session. In the second post-training session (session 14), the child’s reciprocation of the correct sequence after being given Prompt 1 increased to 80% and his dependence on Prompt 2 decreased to 20%. This shows an increasing trend of the child’s ability to reciprocate the complete sequence. More sessions are needed to determine whether the child can consistently reciprocate with the correct sequence at this proficient rate.

Figure 2 represents the child appropriately responding to a student clinician asking, “How are you?” The student clinicians asked this question only after the child initiated a social interaction. Data are presented as the percentage of correct responses the child made out of the total number of opportunities the child had to respond in each session. With the trainer, the child’s percentage correct responses increased over the course of eight sessions, with some variability of trend ($M = 47\%$). This response generalized to the five additional student clinicians after two sessions. The child’s percentage of correct responses also increased with the five student clinicians with some variability ($M = 53\%$). After social reciprocation training, the response occurred at a high, stable rate with the trainers ($M = 100\%$).

Discussion

The ability to initiate a social interaction and achieve back-and-forth conversation are important skills for young children with ASD to develop because they can lead to more positive interactions with therapists, family members, teachers, and peers. The present study evaluated the success of social skill training procedures in teaching a child with ASD how to initiate and

reciprocate a social interaction and the generalization of this skill across five student clinicians with whom he worked in an inter-professional autism clinic. After training the child to initiate a social interaction by saying “hi” within 5 seconds of a student clinician’s approach, this response generalized across settings (to every room in the clinic) and people (to five student clinicians who were not involved in training). Experimental control of the social initiation behavior was demonstrated within a multiple-baseline across behaviors design. The child was able to initiate a social interaction only after the child was trained to do so.

Anecdotal data suggested that the child further generalized this social initiation response to other therapists in the clinic, to the school setting, and to extra-curricular activities in which the child participated. The speed and extensiveness of the generalization may have been due to the consistent natural positive consequence of the behavior. When someone said, “Hi”, a positive social attention was delivered immediately in almost all cases. Because positive social attention was the systematic consequence implemented in the study, there was no need to fade a tangible reinforcer so that the desired response could come under the control of a naturally occurring consequence.

Additionally, child’s initiation of social interaction became more natural over the course of the intervention. The student clinicians who acted as probers for the present study were instructed to approach the child at a very close proximity in order to evoke a social initiation. However, after a few sessions in the intervention phase, the child began to initiate a social interaction to a student clinician, who was not a prober, who greeted him at the waiting room of the clinic each session. During the sixth session in the intervention phase, the child said hi to a therapist, who also was not a prober, upon walking into the room for therapy. In the next session, the child initiated a social interaction with one of the probers upon making eye contact at a

distance of about 2 meters away, rather than waiting for the prober to be in very close proximity to the child.

Future research can further assess generalization in a school setting, as well as in the home. Anecdotal data suggested that the child generalized the social initiation response to the school setting, to student clinicians who worked both in the clinic and the child's school. However, it is unknown whether the response generalized to the child's teachers. In addition, in the present study, a young child with ASD learned to initiate a social interaction and achieve a short back-and-forth conversation with adults. Future research could investigate whether these competencies generalize to the child's peers.

Anecdotal data also suggest that the child's social initiation behavior may have overgeneralized to include strangers that he may see while in the community. Future research could implement discrimination training to teach the child the settings in which settings it is appropriate to initiate a social interaction.

The data presented in Figure 2 may suggest that initiation of a social interaction and responding appropriately to "How are you?" are a response class. A response class is a group of responses that have the same function, or the same effect on the environment (Cooper et al., 2007). Both behaviors involved the child making a single-syllable verbal response directed at one of the probers. For both behaviors, the probers responded immediately by simultaneously delivering both positive touch and positive social attention by reflecting the child's response. The probers responded to the child saying "hi" by saying "hi" back to the child and responded to the child saying "good" by saying "good" with a tone that implied that the child did a good job of providing an appropriate response to the probers' question. Prior to the third session of the intervention phase, the primary investigator of the present study had defined social reciprocation

as the child giving an appropriate response to “How are you” within 5 seconds of a prober asking the question. However, due to the possible response class that emerged, it soon became evident that a low, stable baseline would not be achieved for social reciprocation according to the aforementioned definition. Therefore, in order to achieve experimental control through a multiple-baseline design, social reciprocation was redefined as the child asking the prober “How are you” after responding to the question. This meant that the child’s last response in the back-and-forth conversation with the probers would be, “Good, how are you?” Because the researchers of the present study did not predict that the child would be able to appropriately respond to “How are you” without specific training for this skill, baseline data for social reciprocation did not commence until the third session of the social initiation intervention. This altered the timeline of the study, so results for the social reciprocation intervention have not yet been calculated. Future research should assess the child’s social competencies relating to all responses relevant to the study prior to taking baseline data.

There were several limitations to the social reciprocation training. Firstly, due to the complexity of the skill to be trained, training procedures had to be altered several times before settling on a procedure that combined backward and forward chaining. Therefore, initial training sessions were likely inefficient. In addition, data were not collected during the first two training sessions, so the researchers are unable to systematically compare the child’s performance in the last training session to that of previous sessions. The child performed a repertoire of aggressive behaviors during the first training session, and thus, neither trainer could observe and take data. Because of this, a third trainer was added during the second training session. Still, due to a change in training procedures, none of the three trainers were available to take data. Therefore, in the third training session, a data collector was introduced. The child’s non-compliance was

another challenge during training. During the third training session the child did not make any response to 21.67% of the probes, although he had displayed that he was capable of doing so. This also contributed to the inefficiency of training. Because the clinic where the research was conducted is a part of a university, it closed at the end the spring semester. Therefore, we were unable to conduct a fourth training session.

The participant of the present study performed a repertoire of aggression and elopement behaviors in the clinic where the study took place. The child often performed these behaviors during transition times when probes for the study were to occur. Because these behaviors sometimes interfered with the probes, the number of probes that could be conducted during each session was limited. Response per opportunity data may have been different had the number of probes not been limited by interfering behaviors. For example, if the child responded correctly six out of nine opportunities for a score of 66.67%, this percentage may increase or decrease if the child was given 13 opportunities. The interfering behaviors also accounted for variability in the number of probes that occurred during each session. Response per opportunity data would be more meaningful if the number of opportunities per session could be controlled. Additionally, the child's aggression and elopement behaviors may have contributed to the variability in the data presented in Figure 2. For example, if the child ran away from the prober after "How are you?" was asked, he did not respond. However, if the child's elopement behavior had been extinguished during the study, perhaps a more stable rate of responding would have occurred.

Observations were taken during transitions between therapy sessions and from work to play. Characteristically, transitions are difficult for many children on the autism spectrum. The participant of the present study often attempted to elope and performed a repertoire of aggressive behaviors during transitions. When transitioning from therapy sessions with his parent, the

participant would typically perform some tantrum behaviors. It is notable, then, that the participant still generalized the initiation behavior at a very high rate during transitions. During some of the more difficult transitions, the participant would stop performing some of his problem behaviors in order to initiate a conversation with a student clinician. This suggests that this study may have helped the child learn a replacement behavior for recruiting positive adult attention.

The present study is an expansion of research on the experimental programming of a generalized greeting response conducted by Stokes et al. (1974). Both the present study and that of Stokes et al. (1974) utilized positive reinforcement and prompting so that participants could develop a useful social initiation response. Both studies utilized additional trainers and different settings (different rooms in the clinic/residential facility) to promote generalization, and at the completion of both studies, the participants generalized an initiating social greeting to several probers. In addition, both primary authors received anecdotal reports that the response generalized to many settings outside of where research was conducted. In addition, a participant in both studies overgeneralized the response to inappropriate situations. Stokes et al. (1974) noted that discrimination training after the completion of the study was successful in restricting the social initiation response to only appropriate situations. This emphasizes the need for discrimination training with the participant of the present study. The present study differed from that of Stokes et al. (1974) in the population and setting of the research. Authors of the present study worked with a child with ASD in the context of an inter-professional autism clinic while authors of previous study worked with children and adolescence with intellectual disability in the context of a residential facility. The present study expanded upon the research of Stokes et al. (1974) by assessing the success of training procedures in programming a generalized social reciprocation response. This social skill proved to be more complex than the initiating response.

Due to time constraints in the present study, further research is needed to determine if the social reciprocation response would generalize.

In conclusion, the present study demonstrated the effectiveness of training procedures in teaching a child with ASD to initiate and generalize a social interaction (Stokes & Baer, 1977). This response generalized to individuals who were not involved in training, as well as to other settings.

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Figure 1

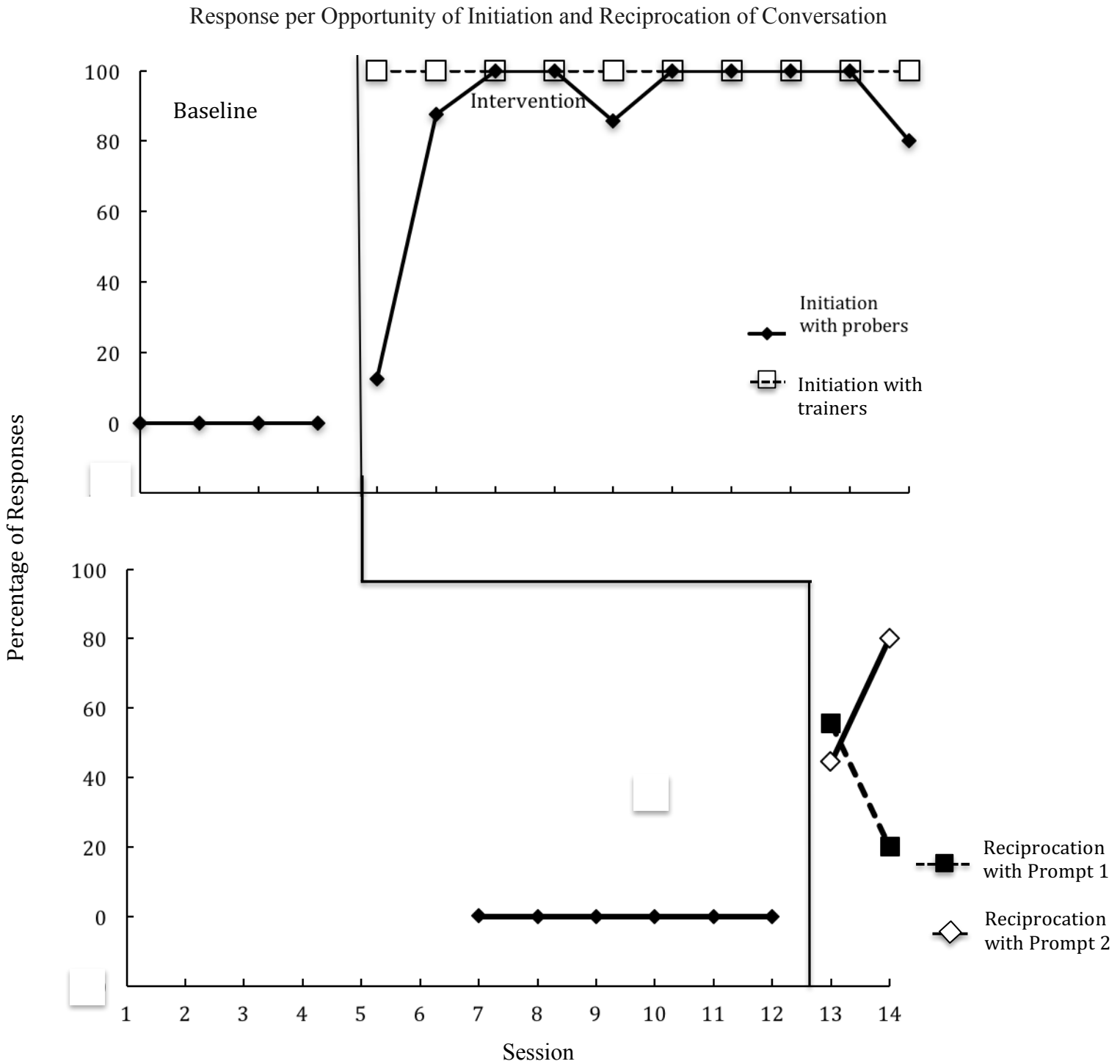


Figure 1: Percentage of responses per opportunity of independently initiating a conversation by saying “Hi” within 5 seconds of a clinician’s approach and subsequently responding, “Good, how are you?” when a clinician asked, “How are you?”.

Figure 2

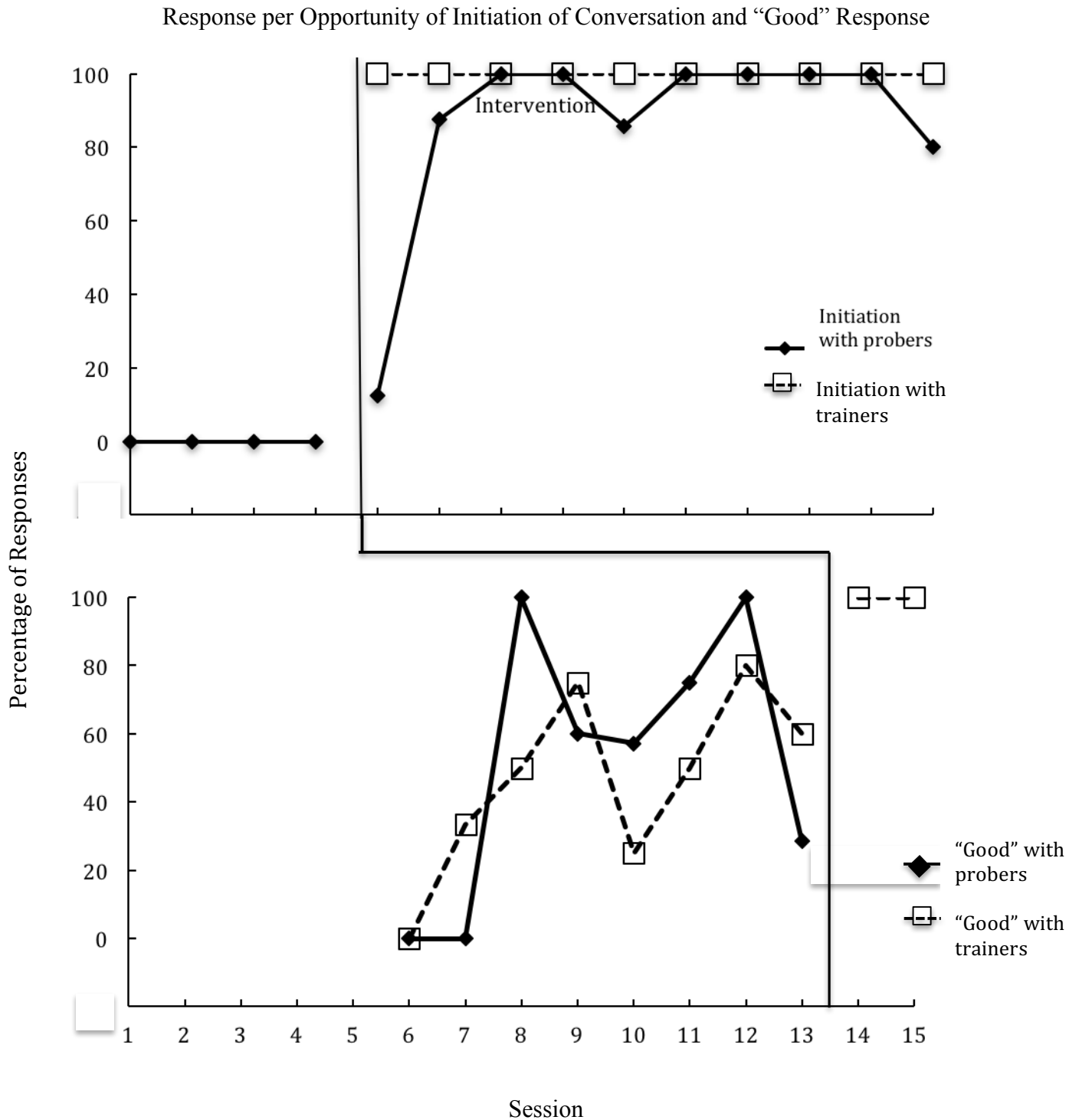


Figure 2: Percentage of responses per opportunity of independently initiating a conversation by saying “Hi” within 5 seconds of a clinician’s approach and subsequently responding “Good” when a clinician asked “How are you?”.