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Group teaching of conversational skills to adolescents on the autism spectrum

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ABSTRACT

Adolescents with autism struggle with developing meaningful social relationships. Learning appropriate conversational skills can be an important first step in creating friendships. A procedure that has been effective in teaching conversational skills to typically developing adolescents is the teaching interaction procedure, which involves describing the target behavior, why it should be used, when it should be used, and the steps in the skill, modeling the behavior, and having the learner role-play. Throughout the teaching process, feedback is given to the adolescent. The purpose of this study was to investigate whether the teaching interaction procedure could be used to teach adolescents with autism conversational skills in a group setting. Five children, four on the autism spectrum and one with ADHD, were taught conversational basics, how to give positive feedback to a speaker, and how to answer and ask open-ended questions. A multiple-probe design across behaviors and replicated across participants revealed that four of the five participants mastered all three conversational skills, while the fifth participant mastered two of the skills. While no participants fully generalized the skills to interactions with a typical peer, participants showed some generalization to those interactions.

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1. Introduction

A failure to develop appropriate social relationships is a defining characteristic of children and adolescents with autism. At any age, building friendships is important, but as children with autism move into adolescence positive peer relationships can have a profound impact on the success of the student both academically and personally. Research reports that adolescents with autism who have fewer friends perform worse in school and have an increased risk for psychiatric problems such as depression (Bauminger & Kasari, 2000, 2001; Bauminger, Shulman, & Agam, 2003; Stewart, Barnard, Pearson, Hasan, & O'Brien, 2006). Thus, helping adolescents with autism learn appropriate social skills that can lead to the development of positive peer relationships should become an important focus of treatment.

One set of social skills that may help adolescents with autism develop positive relationships with peers are conversational skills. The ability to communicate effectively with peers allows the sharing of information, ideas, and interests in a way that may lead to the development of friendships. The ability to engage in a conversation requires many different skills, including: providing eye contact, maintaining appropriate proximity, initiating and ending the interaction, and making on-topic statements.

There have been a number of techniques used to teach conversational skills to children and adolescents with autism, including: script fading (Krantz & McClannahan, 1993, 1998; Sarokoff, Taylor, & Poulson, 2001), video modeling

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(Charlop-Christy & Daneshvar, 2003; Charlop & Milstein, 1989; Haymes, 1995), pivotal response training (Koegel, Koegel, Hurlley, & Frea, 1992; Koegel & Frea, 1993; Pierce & Schreibman, 1995), and various peer-mediated techniques (Deming, 2000; Krantz, Ramsland, & McClannahan, 1989; Kyparissos, 1997; Pierce & Schreibman, 1995, 1997).

While these approaches have led to successful interventions to improve the conversational skills of the children and adolescents with autism, very few reported studies involve delivering treatment within a group setting (Barry et al., 2003; Kroeger, Schultz, & Newsom, 2007; Williams, 1989), and those that do often lack sufficient information or data to allow a determination of the effectiveness of the teaching within the group. For example, Williams (1989) and Barry et al. (2003) only reported survey data as a measure of effectiveness and did not report any behavioral measures for any of the children with autism served. Kroeger et al. (2007) report that, of two social skills groups differing only in the presence or absence of a direct teaching condition, participation in both groups resulted in increases in pro-social behavior but with the direct instruction group showing much larger gains in social skills as measured both by direct observation and questionnaire measures.

It is important to continue to evaluate the effectiveness of group instruction for children and adolescents with autism – especially when teaching conversation skills – because group instruction may offer a number of benefits over individual instruction in teaching conversational skills, including: the opportunity for observational learning to occur (Charlop, Schreibman, & Tryon, 1983; Ledford, Gast, Luscre, & Ayres, 2008), more efficiency in delivering instruction to multiple students at one time (Hazel, Schumaker, Sherman, & Sheldon-Wildgen, 1982; Hazel, Schumaker, Sherman, & Sheldon, 1982), the presence of a more social environment in which skills may be practiced, and increased likelihood of generalization of learned skills from teaching to more natural environments. Since few studies have been reported involving direct group instruction of social skills to children and adolescents with autism, other relevant literatures may be used to suggest group-based interventions or components of those interventions which might inform such intervention with adolescents with autism.

A group teaching procedure that has been demonstrated to be effective in teaching conversational skills to typically developing adolescents (Hazel, Schumaker, Sherman, & Sheldon-Wildgen, 1982; Hazel, Schumaker, Sherman, & Sheldon, 1982; Minkin et al., 1976) and has recently been evaluated in teaching other social skills individually to children with autism (Leaf et al., 2009) is the teaching interaction procedure. Initially developed as a component of the Teaching Family Model intervention for delinquent youth (Fixsen, Wolf, & Phillips, 1973; Phillips, Phillips, Fixsen, & Wolf, 1971; Phillips, Wolf, Fixsen, & Bailey, 1976), the teaching interaction procedure involves a detailed presentation of information about the skill to be taught and behavioral rehearsal with feedback. During a teaching interaction, the teacher labels and describes the skill to be taught, provides rationales for why the adolescent should engage in the behavior, discusses the environmental cues that indicate the behavior should be used, models the behavior for the adolescent, and finally asks the adolescent to role-play and practice the behavior. Throughout the teaching interaction, the child is given praise and corrective feedback about their performance in answering questions and role-playing.

In two studies, Hazel, Schumaker, Sherman, and Sheldon-Wildgen (1982) and Hazel, Schumaker, Sherman, and Sheldon (1982) used the teaching interaction procedure to teach social skills – including conversation – to groups of adolescents. In the first (Hazel, Schumaker, Sherman, & Sheldon-Wildgen, 1982), three groups that together included 13 court-adjudicated adolescents on probation learned eight social skills including giving and receiving negative feedback, conversation, resisting peer pressure and negotiation in a multiple-baseline-across-behaviors design. On average, all three groups improved their performance during role-plays of each target skill following teaching, but since individual data was not presented it is not possible to determine the specific impact of teaching on each individual participant. In the second study (Hazel, Schumaker, Sherman, & Sheldon, 1982), Hazel and colleagues taught six of the same skills as the study above (Hazel, Schumaker, Sherman, & Sheldon-Wildgen, 1982) to three groups of adolescents. One of the groups of adolescents contained only participants with learning disabilities, while the other two groups contained adolescents with no disabilities. Again using a multiple-baseline-across-behaviors design, the authors demonstrated that the adolescents could more successfully role-play all six skills after teaching than during baseline. The group containing participants with learning disabilities learned the six skills to the same level as the other two groups containing adolescents with no disabilities. Again, however, no individual role-play data were reported. The specific impact of teaching on the individual participants is unknown. Nevertheless, these two studies suggest that the teaching interaction procedure can efficiently and effectively teach social skills – including conversation – to adolescents with and without disabilities. While these studies do not include children or adolescents with autism, a more recent study has reported results which suggest the teaching interaction procedure as used by Hazel and colleagues can lead to improved social skills in children with autism.

Leaf et al. (2009) used the teaching interaction procedure to individually teach social skills to children with autism. Three children with autism each learned four social skills. The children received instruction in a one-on-one setting, and all four participants mastered the skills taught to them. While the study provided a first demonstration of the effectiveness of the teaching interaction procedure with children with autism, it left unanswered the question about the procedure's effectiveness with adolescents on the autism spectrum receiving instruction in a group format.

The purpose of the present study was to determine whether the teaching interaction procedure was effective in teaching three conversation skills to five adolescents (four on the autism spectrum and one sibling with ADHD) in a group arrangement and to investigate to what degree the skills generalized to more naturalistic settings with a typical peer.

2. Method

2.1. Setting

The study took place within a social skills group for eight adolescents which met twice a week for a total of 3 h (1.5 h per meeting). The group met after school on Tuesdays and Thursdays. Teaching took place in a classroom at a large mid-western university. The classroom consisted of a large open area with several desks and tables arranged in 2–3 small clusters.

To be included in the social skills group, participants had to meet several criteria, including: good expressive and receptive language and no immediate history of self-injurious, aggressive, or severe disruptive behaviors. Direct observations of participants in their natural environments and parental interviews were used to determine if potential participants met these criteria. A total of eight adolescents (six on the autism spectrum, one sibling peer model with ADHD, and one typically developing peer model) were involved with the social skills group. During group meetings, participants learned social skills within several different teaching activities and research projects. Not every participant in the social skills group was a part of every investigation.

2.2. Participants

Of the eight adolescents in the social skills group, six of them participated in this study. Five of them learned the three conversational skills and the sixth acted as a peer model for the other five. Four of the participants (Andy, Alice, Kevin, and Mandy) were diagnosed on the Autism Spectrum. Doug, the sibling of Andy and Alice, had a diagnosis of ADHD and was taught the conversational skills because it was decided he could benefit from the instruction. Additionally, a typically developing peer (Aaron) acted as an interactional partner during generalization probes. Parents reported that all four participants on the autism spectrum had a history of discrete trial teaching and other behavioral interventions prior to this study. Table 1 contains demographic information for all participants.

2.3. Structure of the group

Instruction in the group focused on teaching several types of social skills to the adolescents using both direct and incidental teaching methods. Teachers worked on skills in such domains as recreation skills, emotional skills, and conversational skills. The skills presented in this study are conversational skills and were taught in a large-group instructional format, with the adolescents sitting in a semi-circle facing the lead teacher (first author). Two or three support teachers stood directly behind the participants and delivered social reinforcement for appropriate behavior such as sitting quietly, looking at the teacher, and general compliance. The support teachers also assisted in redirecting any problem behavior that occurred. Instruction in the reported skills took place once each session during a teaching interaction procedure lasting around 30 min.

2.4. Target conversational skills and measures

The participants learned three conversational skills: conversational basics, providing positive feedback to a speaker, and answering and asking open-ended questions. These skills were chosen based on parents' answers on the Social Skills Rating Scale (Greshman & Elliot, 1990), parental interviews, direct observation of participants interacting with peers within the group, and the results of an earlier study by Minkin et al. (1976) suggesting the importance of these skills. All five participants were taught all three skills. The sibling, Doug, already engaged in one of the target behaviors (giving feedback to a partner) during baseline, but he was included in the study because he did not engage in the other skills and it was decided his participation would benefit him more than participation in alternative activities. The skills were broken into smaller behavioral steps and behavioral definitions were written for each step. Table 2 presents an example of the behavioral steps (with definitions) of one of the three skills. The other two skills were broken down into steps and the steps defined in the

Table 1
Participant demographic information.

Name	Age	Sex	Diagnosis
Mandy	18	Female	Autism
Kevin	17	Male	Aspergers ADD Dyslexia
Alice	17	Female	PDD-NOS CP Intermittent Explosive Disorder
Doug	17	Male	ADHD
Andy	13	Male	PDD-NOS ADHD
Aaron	13	Male	Typically developing peer

Table 2
Steps in conversational basics.

Step 1	Step 2	Step 3	Step 4
Maintain eye contact throughout interaction	Maintain appropriate distance throughout interaction	Maintain appropriate body posture throughout interaction	Maintain appropriate voice tone and volume throughout interaction
The participant's face and body are oriented towards the conversational partner. The participant's eyes are oriented towards the conversational partner for the majority of the interaction, and the participant's eyes never look away from the face of the partner for more than 10 continuous seconds at any time during the interaction.	The participant maintains a distance of at least one arm's-length away from the partner and no more than two-arm's-lengths away from the conversational partner during the entire interaction.	The participant maintains an erect and relaxed posture during the entire interaction. The participant does not engage in any distracting behaviors such as rocking, tapping feet, repetitive hand flapping, excessive fidgeting, repetitive manipulation of objects (e.g. twisting or spinning a pencil or paper clip), etc.	The participant maintains a positive voice tone during the entire interaction. The volume of the participant's voice is loud enough that the observer and peer can hear each word clearly, but which is not loud enough to cause a reaction from other peers and teachers in the classroom.

same way. All three target skills were assessed during various probes conducted throughout the group's meeting time. Table 3 describes how the three skills were probed. Three types of probes were used to assess the learning of the adolescents. The three types of probes are described in detail below.

2.5. Dependent measures and reliability

The dependent variable in the study was the performance of the individual skill steps by the participants during the three types of probes. During each probe, observers scored the occurrence or non-occurrence of each step of the skill targeted by the probe. Reliability was measured during 69% of teaching, baseline, and maintenance probes and 89% of generalization probes. Reliability was calculated by dividing the number of relevant skill steps that the two observed agreed had been displayed or not displayed by the participant by the total number of steps in the skill. The reliability between observers averaged 90% (range 66–100%) for baseline/maintenance and teaching probes and 81% (range 67–89%) for generalization probes across all social behaviors. Generalization probes occurred in less structured settings and with unstructured conversations, making it difficult to achieve extremely high levels of reliability.

2.6. Treatment integrity and independent variable reliability

To evaluate treatment fidelity and independent variable reliability, the teaching sessions were videotaped and a randomly selected 26% of the videotapes were independently scored by two observers. The observers scored the occurrence or non-occurrence of each component of the teaching interaction procedure (described below). Treatment integrity was 100% across all teaching interactions scored, and reliability between the two observers was also 100%.

2.7. Types of probes

2.7.1. Teaching probes

These probes determined participant mastery of target skills. Probes occurred as the final portion of the teaching interaction described in more detail below. During teaching probes, the adolescents sat in a group and an adolescent was asked to come to the front of the group and role-play the skill currently being taught with one of the undergraduate teachers. If the adolescent correctly role-played the skill, social reinforcement was given. If the skill was not correctly role-played, then the lead teacher delivered corrective feedback and asked the adolescent to role-play again. Adolescents participated in one or two teaching probes during each teaching interaction. If an adolescent participated in two teaching probes during a teaching

Table 3
Probe structure for conversational skills.

Skill	Role-play and teaching probe	Generalization probe
Conversational basics	Undergraduate teaching assistant engaged adolescent in brief, three-turn conversation while providing a mix of statements and questions	Typical peer and adolescent with autism sat together and were prompted to talk about some topic, such as "Talk about what you did last weekend."
Providing feedback	Undergraduate teaching assistant engaged adolescent in brief, three-turn conversation and makes one statement per turn, such as "I enjoy playing baseball because I like getting to hit the ball."	Typical peer and adolescent with autism sat together and were prompted to talk about some topic, such as "Talk about what you did last weekend."
Answering and asking on-topic questions	Undergraduate teaching assistant engaged adolescent in a three-turn conversation, beginning each turn with an open-ended question such as "What is your favorite TV show?" and "Who is your favorite character on that show?"	Typical peer and adolescent with autism sat together and were prompted to talk about some topic, such as "Talk about what you did last weekend."

interaction, there were at least two role-plays by other adolescents between the two probes. The teaching sessions and the teaching probes continued until all or all but one of the participants reached mastery criteria: three consecutive 100% correct role-plays of all skill steps during teaching probes across at least two consecutive teaching sessions. If all but one participant reached mastery, then that participant was provided one more teaching interaction (with two probes) in which to reach mastery criteria before the group moved onto the next skill. Teaching probes provided ongoing measures of a participant's learning during the teaching of the skills.

2.7.2. *Baseline/maintenance probes*

These probes established baseline measures for skills not yet taught and evaluated maintenance of skills following the teaching condition. These probes resembled teaching probes because participants role-played with an undergraduate teacher and adolescents knew which skill was being probed. Baseline/maintenance probes differed from teaching probes in that adolescents received no feedback about their performance. Baseline/maintenance probes targeted all target skills and were conducted during the same session. These probes were conducted at the beginning of the study and then again following each teaching condition.

2.7.3. *Generalization probes*

Generalization probes were conducted in order to determine if participants would display the three skills in more naturalistic settings and without knowledge of which skill was required. Generalization probes never followed teaching during a group meeting, occurred with one participant at a time, occurred at variable times during the group meetings, and occurred throughout the classroom. A generalization probe started when Aaron, the typical peer (with experimenter prompting) engaged in a behavior that should set the occasion for a conversation from one of the participants (for example, asking an adolescent, "What's your favorite movie?") Aaron was given no formal requirements for his part of the conversation, and was simply asked to talk to the participant for a couple of minutes. Participants received no prior priming or instructions about what skills were expected. Additionally, participants received no consequences for their behavior during the probe.

2.8. *Experimental design*

The experimental design of this study was a multiple-probe design in which all three skills were probed at the beginning of the study. Then, one skill was taught, followed by probes of all three skills. Then the second skill was taught, followed by probes of all three skills, and finally, the third skill was taught, followed by probes of all three skills.

2.9. *Experimental procedure*

2.9.1. *Baseline*

During each baseline session, participants engaged in structured game activities such as Pictionary®, Dominoes, or Trivia. Periodically, the lead teacher called a participant away from the games to another part of the classroom and conducted one of the generalization or baseline/maintenance probes (as described above). The participant then returned to the game activities. Baseline sessions continued until each participant had completed at least three baseline/maintenance probes and at least one generalization probe for each of the three conversational skills.

2.9.2. *Teaching condition*

Following baseline sessions, teaching began. The adolescents sat in a semi-circle facing the teacher and a dry-erase board. Teaching began with the lead teacher describing the skill to be taught (e.g., "Today we are going to talk about having good conversational basics."). Each participant was then asked to state what skill was being worked on during the teaching interaction. Next, the teacher asked each of the participants to provide a rationale why they should engage in the behavior (e.g., "If you make eye contact and have good posture, people are more likely to want to talk with you."). All participants in the teaching interaction had to provide their own rationale for engaging in the behavior. Then the teacher would ask each of the participants to describe a time or situation when they could use the skill (e.g., "I am talking to my friends during lunch at school"). Following that, the teacher described the specific steps of the skill (see Table 3). During this part of the teaching, the teacher asked a participant to state or describe the first step and then asked the rest of the participants to restate the step. This procedure continued until all steps had been presented. For each step in the procedure above, the teacher wrote the adolescents' answers on the dry-erase board.

Following the description of the behavior, the teacher modeled the target skill for the adolescents. During the demonstration, a support teacher engaged in a behavior that should set the occasion for the social skill being taught that session (e.g., the support teacher walked up and asked the lead teacher a question to initiate a conversation). Then, the lead teacher either appropriately displayed the social skill being taught or modeled only part of the skill. Next, the lead teacher asked the participants as a group to critique the teacher's role-play of the target behavior. If the lead teacher had correctly modeled the skill, then the group moved on to the role-playing phase of teaching. If the lead teacher had incorrectly modeled the skill, the participants were individually asked to identify which steps were demonstrated correctly and which needed to be improved. Then, the demonstration was repeated with the lead teacher modeling the skill correctly, and the group moved on to the role-play phase of teaching.

During the final phase of the teaching interaction, adolescents role-played the conversational skill being taught that day in front of the group. Each participant was asked to role-play with an undergraduate teacher. Their interaction was the teaching probe described above. If the participant correctly displayed the behavior during the teaching probe, then reinforcement was given to the participant. If the participant incorrectly role-played the behavior or omitted a step of the behavior, corrective feedback was provided to the participant and the participant was given another opportunity to role-play the behavior. The same consequences were provided on the second role-play as on the first role-play. If, after two role plays, the participant did not display the behavior correctly, the participant was prompted to perform the social behavior correctly by the lead teacher who stated or described each step of the skill to the participant while the third role-play was occurring. Each participant engaged in two teaching probes per teaching circle. Only the participant's first role-play during each teaching probe counted toward the mastery criteria.

3. Results

Figs. 1–5 represent the baseline, teaching, maintenance, and generalization probes for all five participants. Each panel within these figures represents one of the social skills taught. Closed circles represent baseline, teaching, and

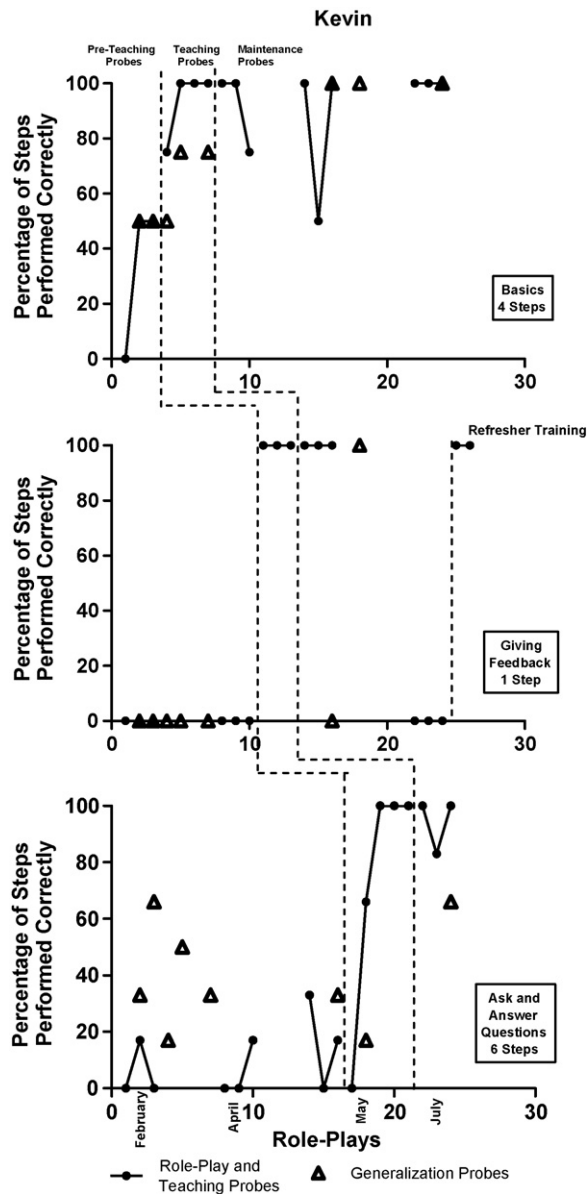


Fig. 1. Probe data for Kevin. Closed circles represent role-play and teaching probes. Open triangles represent generalization probes. Data points represent the percentage of steps in each skill the participant completed correctly during a role-play situation.

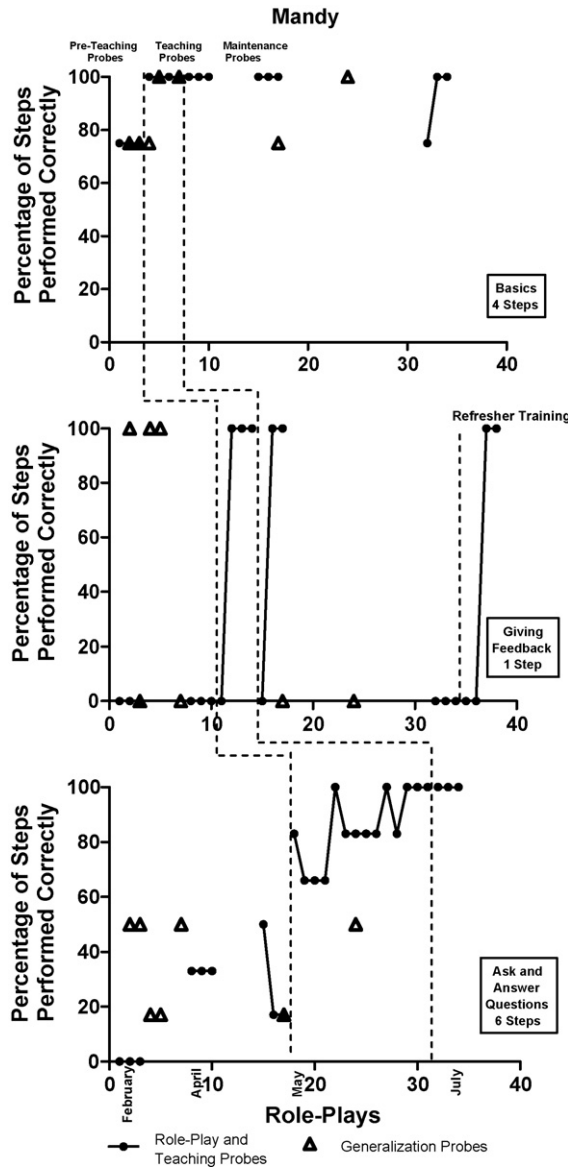


Fig. 2. Probe data for Mandy. Closed circles represent role-play and teaching probes. Open triangles represent generalization probes. Data points represent the percentage of steps in each skill the participant completed correctly during a role-play situation.

maintenance probe data while generalization probe data are represented by open triangles. The horizontal axis displays the number of probes; the vertical axis displays the percentage of skill steps the participant correctly demonstrated during probes.

Across all skills, participants only began demonstrating the skill correctly following the implementation of the teaching interaction procedure to teach the skill. This improvement, which occurred when and only when the intervention was implemented, suggests that the teaching interaction procedure was responsible for the improvements in performance seen in the adolescents. The only exception to this pattern was Doug, who, as discussed above, already engaged in the skill of providing feedback to conversational partners prior to intervention.

Four of the five participants met mastery criteria for the first skill, conversational basics. The fifth participant (Alice), while not reaching mastery criteria during teaching, still engaged in the behavior at a higher rate during teaching. All five participants mastered both the second and third skills, giving feedback and answering and asking questions. Maintenance data indicate that most participants maintained higher-than-baseline performance on the first two skills even several months after teaching. Both Mandy and Kenny, however, did not maintain providing positive feedback to speakers during follow-up measures. Both Mandy and Kenny were given individual booster sessions at the end of the study to re-establish the behavior.

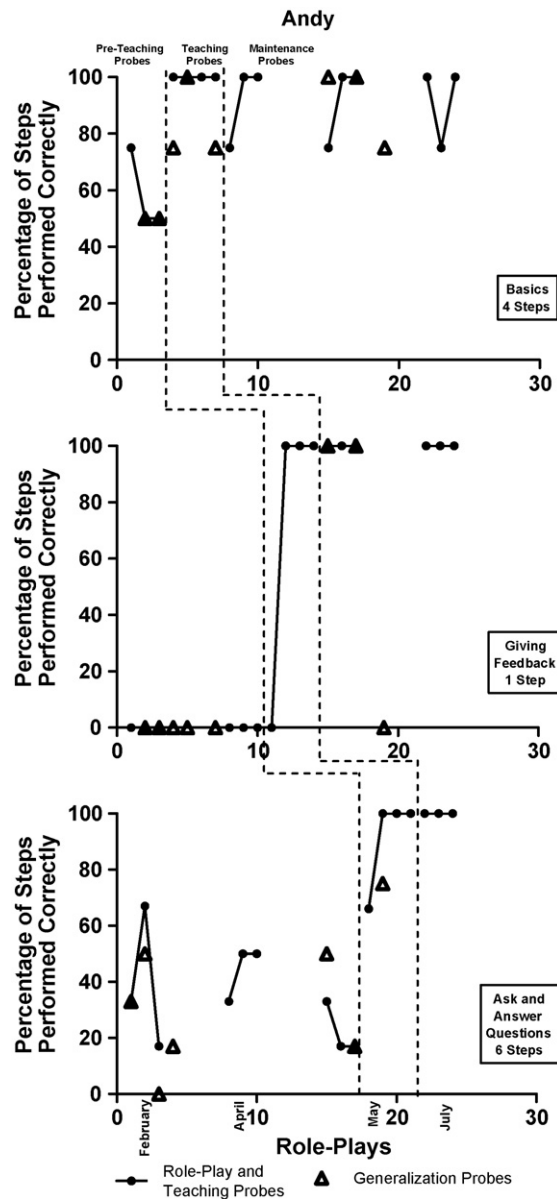


Fig. 3. Probe data for Andy. Closed circles represent role-play and teaching probes. Open triangles represent generalization probes. Data points represent the percentage of steps in each skill the participant completed correctly during a role-play situation.

The generalization data indicate that the three skills were not fully generalized to more naturalistic situations with the typical peer during the group meeting. While all five participants show some level of generalization, only three of the participants (Doug, Kevin, and Andy) reached 100% generalization of any of the skills.

4. Discussion

Overall, the teaching interaction procedure proved successful at teaching three conversational skills to five adolescents: four on the autism spectrum and one sibling with a different diagnosis. Three of the five participants maintained the skills following teaching and did so across several months for the first two skills. Two of the five participants maintained two of the skills after teaching and recovered the third skill following a booster session. While no participants fully generalized all of the skills to a more naturalistic setting with a typical peer, the participants did show partial generalization.

The results of the study suggest that the teaching interaction procedure that has previously been successful at teaching adolescents with and without learning disabilities (Hazel, Schumaker, Sherman, & Sheldon-Wildgen, 1982; Hazel, Schumaker, Sherman, & Sheldon, 1982) and children with autism (Leaf et al., 2009) social skills has also been effective in

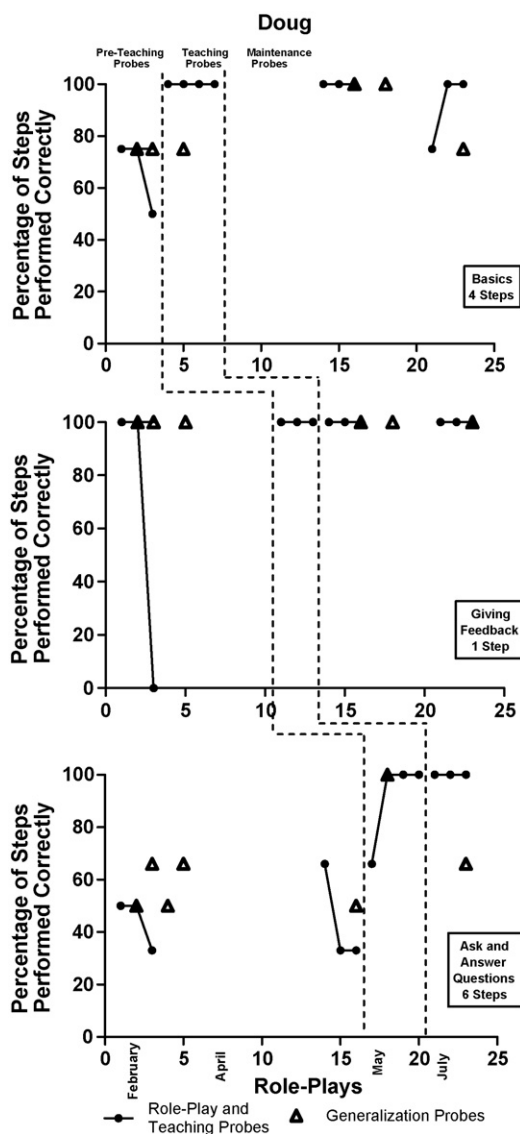


Fig. 4. Probe data for Doug. Closed circles represent role-play and teaching probes. Open triangles represent generalization probes. Data points represent the percentage of steps in each skill the participant completed correctly during a role-play situation.

teaching conversational skills in a group instructional setting to the adolescents on the autism spectrum in the present study. Further demonstrations with additional adolescents who might possess different characteristics (lower-functioning, less language, presence of more severe challenging behavior) must be done before the generality of the procedure can be established. It is possible that this procedure may only be appropriate for a particular subset of adolescents with autism (higher-functioning, good language skills, etc.), but such boundaries on the effectiveness of the procedure will only become known with further research.

The primary limitation of this study was the failure of the participants to fully generalize the skills to more naturalistic interactions with a typical peer. One reason for the failure may be the limited number of structured opportunities for these interactions to occur that were offered during the study. If more generalization probes had been conducted, then the increased number of chances to interact in a structured way may have led to increased amounts of generalization. Another reason for the failure to generalize may have been the use of undergraduates to role-play with the adolescents during the teaching interaction procedure. If a typical peer had been the role-play partner during the teaching interaction, it may have been more likely that the skills would generalize outside of the teaching setting. Future research might explore more formally various ways in which generalization of skills can be achieved within the teaching interaction procedure. Additionally, Aaron, the typical peer, was given no formal instructions during generalization probes; thus, his behavior did not exactly resemble the more structured conversational exchange provided by the undergraduate teachers. If Aaron had engaged in the exact type of structured interaction as that conducted during probes, more generalization may have been

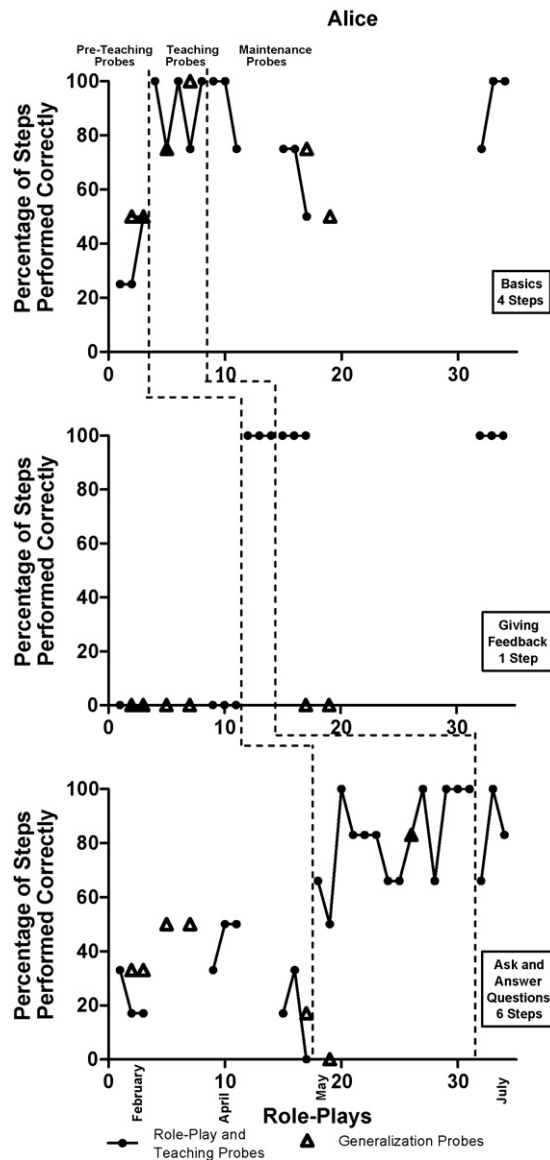


Fig. 5. Probe data for Alice. Closed circles represent role-play and teaching probes. Open triangles represent generalization probes. Data points represent the percentage of steps in each skill the participant completed correctly during a role-play situation.

seen. Such guidance was not provided to Aaron, however, because the experimenters wanted a more rigorous test of generalization that more closely resembled a natural encounter in the adolescents' normal environments of home and school. The behavior measured during generalization probes, however, did not capture all of the instances in which the participants interacted with each other and the typical peer during the course of a group meeting.

Casual observation of interactions between the participants and the typical peer during the course of other activities in the social skills group suggested that while they often talked, it rarely occurred in the context of a one-on-one conversation. Instead, it happened while playing games such as soccer or trivia. In other words, conversations were happening, but the measurement system was not capturing it because measurement only occurred during face-to-face interactions in which no other activities were occurring. Future research might explore ways to measure the same conversational skills in more naturalistic settings such as game-play, lunch periods at school, and passing periods between classes. A challenge of such research would be to specify behavioral definitions which capture the less formal nature of such interactions while still remaining specific enough to allow reliable measurement. An additional positive outcome noted during casual observations was that the participants in the study began to interact outside of the social skills group setting. For example, one adolescent entered all of the other participants' names into his cell phone as soon as he got it, and a number of the participants began going to movies and interacting on Facebook together. It would be desirable to find a way to quantify such activities as an indicator of the most important social outcomes for adolescents with autism—developing friendships and enjoying positive interactions with peers.

In spite of the limitations of the study, several aspects of the results suggest that the teaching interaction procedure may be a useful approach to teaching social skills to adolescents with autism in a group setting. First, the group-based format allowed for efficient instruction to multiple participants at the same time—an advantage for teachers who may be working with limited resources. Second, the group-based instruction also offered the advantage of allowing the participants to observe each other and the typical peer as they answered questions and role-played the skills. This increased the likelihood of observational learning and allowed the teachers to point out the various ways in which the different participants executed the same skills correctly. This was viewed as an advantage within the group since the multiple exemplars helped demonstrate that conversations are not rigid and exactly the same every time. Finally, the straightforward structure and interactive nature of the teaching interaction used in the study made it easy to implement with a high degree of fidelity. Such ease of implementation is an advantage in that less highly trained staff can be taught to conduct the teaching interaction procedure.

In summary, the present study indicates that the teaching interaction procedure was successful in teaching conversational skills in a group-based setting to five adolescents: four on the autism spectrum, and one sibling with ADHD. While those skills did not fully generalize to interactions with a typical peer, for most participants, the skills were maintained after teaching, and in all cases participants showed higher-than-baseline levels of performance following teaching.

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