The Effects of Observational Training on the Acquisition of Reinforcement for Listening

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Abstract

Experiment 1investigated the effects of observational training in a social listener reinforcement game on participants' conversational units in non-instructional settings. Experiment 2 tested the effects of multiple exemplar instruction on the development of "empathy." The participants who had reader/writer levels of verbal behavior were selected because they emitted a low number of speaker and listener exchanges with others and did not have empathy as measured in the study. In Experiment 1, data were collected on the number of sequelics, conversational units, "wh" questions, vocal approvals and vocal disapprovals during 5 minute probe sessions after meeting criterion on each objective of the listener reinforcement game. During intervention, the participants were required to engage in a speaker listener exchange through playing a yoked contingency game where they competed with the experimenter to teach several objectives including "I Spy", peer tutoring, textually responding and group instruction. Data showed that the total number of verbal interactions in non-instructional settings significantly increased for both participants. In Experiment 2 multiple exemplar instruction across questions was implemented to teach the participants empathy. The participants responded to 3 questions: "What happened?" "How does the person feel?" and "What could you do to help?" The results showed a significant increase in correct responses to empathy questions.
Keywords: autism, empathy, observational training, reinforcement for listening.

Many children with autism do not have a history of reinforcement for listening to others. Listening to others is a critical component of social experiences that leads to more advanced listener repertoires such as emitting behaviors characterized as empathy. Skinner (1957) proposed a theory on the function of verbal behavior based on operant research. Verbal behavior was defined by Skinner as "behavior reinforced through the mediation of others" (Skinner, 1957, p. 2). Verbal behavior is categorized based on function into mands, tacts, intraverbals, autoclitics, echoics, and textual topographies. Skinner (1957) discussed verbal behavior from the point of view of the speaker as mediated by the contingencies of the listener. The listener provides reinforcement for verbal repertoires in the form of providing access to a preferred item or generalized reinforcement. Verbal behavior is analyzed through the function of the behavior and is emitted to affect the behavior of a listener. Catania (1998) expanded on Skinner's views and stated that, "Verbal behavior involves both listener behavior shaped by its effects on the speaker's behavior, and speaker behavior shaped by its effects on the listener's behavior" (Catania, 1998, p. 262)

Greer (2002) expands upon Skinner's verbal repertoires. Greer also includes naming, the conversational unit, the learn unit and joint stimulus control as extensions to the operants proposed by Skinner. A conversational unit is defined as "one full exchange in which the student emits both a speaker response that is reinforced by the verbal behavior of another person responding as a listener and in turn a listener response by the initial speaker" (Greer, 2002, p. 91). Conversational units are directly reinforced by the listener who responds in the role of the speaker (Greer, 1989). Each member must respond as both speaker and listener to complete the conversational unit.

Truly social behavior is measured by the presence or absence of conversational units. One emits conversational units because of the reinforcement obtained as both a speaker and a listener (Donley &

Greer, 1993; Lodhi & Greer, 1989). The key component of conversational units is the capacity of an individual to be reinforced by listening. If an individual is not reinforced by what another has to say, there will not be a speaker listener exchange, only a sequelic. A conversational unit occurs when someone says something to another and the speaker is reinforced by the response of the listener, and when the listener continues the interaction by obtaining a verbal response from the speaker again. The response includes the rotation of speaker and listener responding between two or more individuals. Often, the repertoire of social listening is absent in children diagnosed with autism. Experimenters need to establish teaching interactions to teach individuals the reinforcing effects of listening (Greer & Ross, in press). When the effects of listening, as the extension of the listener's sensory experience is missing, the advancement of social repertoires is thwarted according to Greer and Ross.

Many individuals need to be taught how to effectively listen to others to obtain reinforcement and develop higher capabilities. Few studies have tested how to teach individuals to become good listeners and express empathy. Ross (1964) investigated the effects of listening ability on reading, arithmetic, and personal and social adjustment. He administered assessments on 90 participants in grades 5 through 7 and found that those with good listener repertoires scored a higher percentage on all studies than poor listeners. Good listeners were found to be better in reading and mathematics (Ross, 1964). According to Ross (1966), participants spend approximately half of every school day engaged in activities which require them to be good listeners and school systems often assume that every participant already has the listening repertoire.

Lawson (1964) investigated the effects of listening on the speaker repertoire. He suggested that the development of the listener repertoire had a role in the development of speaker skills. Mueller (1972) analyzed conversations between 24 pairs of children between the ages of 3 and 6. Results showed that 45% of speaker/listener exchanges involved looking at the peer, while 94% of all utterances involved attention-getting techniques to make sure that the peer was listening.

Shatz and Gelman (1973) analyzed the speech of sixteen 4 year olds and found that the participants adjusted their speech in response to different listeners. Results showed that there was a direct correlation between word choice and length of each vocalization and the listener repertoires of the audience. These results suggest that children learn to modify their speech for an audience at a young age.

The authors propose that the listener component of a verbal exchange is a prerequisite skill of what others have identified as empathy (Poole, 2005). Thus, we suggest empathy is an extension of reinforcement for listening. Once a participant has acquired reinforcement for the listener component of a conversational unit, they develop the capacity for empathy. Skinner (1957) described empathy as the reinforcement function for the listener as having their senses extended. He listed function of verbal behaviors as evoking strong emotional response and "making the listener pay attention" (Skinner, 1957, p. 162). In some literature, empathy is known as theory of mind (McHugh, Barnes-Holmes, Barnes-Holmes & Stewart, 2006hk). This involves taking the perspective of another. Hayes, Barnes-Holmes & Roche (2001) describe perspective taking as a set of deictic relations that specify the relation between the speaker and the listener (ex I – You, Here-There, Now-Then). Listening and comprehension between a speaker and a listener, as acquired through observational training, may be the critical step that leads to the development of empathy.

Since empathy has been treated as a component of theory of mind (McHugh, Barnes-Holmes, Barnes-Holmes & Stewart, 2006) and children with autism are identified as lacking a sense of empathy because they lack "theory of mind." (Baron-Cohen, Leslie, & Frith, 1985). Children who are unable to take the perspective of another person will be unable to predict others behaviors (Baron-Cohen et al., 1985). Therefore, one essential component for the development of empathy is perspective taking. Perspective taking is defined by developmental psychology as "the ability of an individual to interpret his/hers emotional and mental states and those of others" (Gómez-Becerra, Martín, Greer, &Chávez-

Brown, 2006, p.2). The capacity to identify what individuals know about themselves (their own thoughts, feelings, and behaviors) and what they know of other individuals in the same situation is implied by taking the perspective of others (Nickerson, 1999). Therefore, perspective taking is an important component of empathy.

Empathy is defined as "the action of understanding, being aware of, being sensitive to and vicariously experiencing the feelings, thoughts, and experience of another of either the past or present without having the feelings, thoughts, and experience fully communicated in an objectively explicit manner" by the Merriam-Webster online dictionary (2006). This includes being aware of one's feelings and the awareness of feelings of others (Poole, 2005). Therefore, the authors operationally define empathy as the capability to respond to contingencies in the environment that require an individual to take the perspective of others through directly observing the behavior of others. Students with empathy have the repertoires to accurately tact another's feelings and identifying what they can do to help. A tact is a verbal operant under nonverbal antecedent control that makes contact with the environment (Skinner, 1957). An example of a tact of another's feelings was tacting a girl who is crying as feeling sad. Very few studies have been conducted to teach young participants empathy. An exhaustive review of the literature resulted in the finding of a handful of studies to teach medical participants/adults how to develop empathetic relationships with their patients (DasGupta & Charon, 2004; Shapiro, 2002).

Greer, Singer-Dudek, & Gautreaux (2006) have identified yoked contingencies, peer tutoring, and peer monitoring as components of observational training procedures. Yoked contingencies are "conditions in which children must work or learn together, in order for both to receive reinforcement" (Greer & Ross, in press, p. 483). Stolfi (2005) and Davies-Lackey (2005) implemented yoked contingencies for preschool students who did not have observational learning in their repertoires and found increases in the participants' correct responding to untaught operants. This procedure, along with peer tutoring (Greer et al, 2004) and peer monitoring (Gautreaux, 2005; Pereira-Delgado, 2005) have resulted in the acquisition of an observational learning repertoire for students who did not have one prior to intervention. Students learned through indirect contact with the contingencies and acquire new operants without direct instruction.

The purpose of this study was to teach participants the listener reinforcement component of the speaker listener exchange measured as conversational units as a prerequisite to developing the capacity for empathy. Experiment 1 investigated the effects of these observational training procedures on teaching the social listener reinforcement component of the speaker listener exchange of verbal behavior. Experiment 2 tested the effects of multiple exemplar instruction to teach empathy as an extension of the listener reinforcement component.

Experiment 1

Method

Participants. Two female elementary school students diagnosed with autism participated in this study. . Participants A and B had reader/writer and speaker levels of verbal behavior. Both participants had self-monitoring in their repertoires. The participants attended a self-contained CABAS® classroom with 8 students, 1 teacher, and 2 teaching assistants. The participants were chosen for this study because they did not have a history of reinforcement for listening to others during social exchanges measured as conversational units and the capacity for empathy. Table 1 describes the participants in the study. Participant A was 9 years old and had reader/writer levels of verbal behavior. Participant A functioned 2 years behind grade level and did not have a history of reinforcement for listening. Participant B was 8 years old and had reader/writer/self-editor levels of verbal behavior. Participant B functioned 1 year behind grade level and did not have a history of reinforcement for listening.

Table 1. *Participants Grade Level, Age, Level of Verbal Behavior, and Test Scores.*

	Participant A	Participant B
Grade Level of Peers	4th Grade	4th Grade
Age	9	8
Level of Verbal Behavior	Reader/Writer	Reader/Writer/Self Editor
Functioning Grade Level	2 years below grade level	1 year below grade level
Repertoires	Lacked listener reinforcement component of the speaker/listener exchange	Lacked listener reinforcement component of the speaker/listener exchange

Setting. The study was conducted in a suburban elementary school in a self-contained classroom for children with special needs that implemented the CABAS® model (Greer, 2001). The classroom structure consisted of a student, teacher, teaching assistant ratio of 8:1:2. The classroom was equipped with preferred items that were used as reinforcers for academic and social behaviors.

The classroom was divided into two parts. One section was arranged for 1:1 instruction for all curriculum areas. It contained 3 horseshoe shaped tables with adult and children size chairs around the tables. There were also two computers, one located on a table in the back of the room, and one located on a table in the front of the classroom for the experimenter's use. The classroom also had a teacher's desk used by the experimenter at the front of the room. The second section of the classroom was the non-instructional settings where probes for conversational units, sequelics, "wh" questions, approvals, and disapprovals. This area was located in the back of the room to the left of the computer. This area had a variety of toys for the participants to play with including games, books, stuffed animals, and plastic toys. There was also a television next to the computer in the play area.

During baseline conditions 5-minute probe sessions were conducted in the play area. During treatment phases, the participants participated in the study in the classroom. Both participants sat next to each other and across from the experimenter at one of the horseshoe shaped tables. The experimenter had a clipboard, data forms, and a pen to collect data. During intervention, edibles were present. Learn units continued to be presented to other students in the classroom. Long term and short term objectives were based on New York State standards (New York State Department of Education, 2001) and the CABAS Intended Curriculum for the Pre-School through Kindergarten (Greer, 2007). Instructional programs were presented in the form of learn units with continuous measurement of responses to learn units for the curriculum. (Greer, & McDonough, 1999).

Instructional Materials. There were several materials used in this study. Throughout all phases, a game board was used. The game board had two vertical paths with 10 squares with the number two written on each square was used. One path was for the experimenter and one path was for the participants. The participant's game pieces were pictures of Simba, Snow White, and Ariel, and the experimenter's game pieces were pictures of villains including Scar, The Evil Queen, and Ursula. During "I Spy" a mask was used to cover the target participants' eyes and pictures of shapes and numbers were used as target stimuli. A diagram of the game board used is shown in Figure 1. During "20 Questions:

Tact and Textual Response" five sets of four pictures and four textual responses were used. These sets are listed in Table 2 and they consisted of monuments, breeds of cats, dinosaurs, and things found in the solar system. During "Peer Tutoring with the Game Board" 10 sets of stimuli with five tacts /textual responses each were used. These sets are listed in Table 3 and they consist of science, social studies, math, and vocabulary words. During "Group Instruction with the Game Board", five sets of four textual responses of science and social studies words are listed in Table 4.

Design

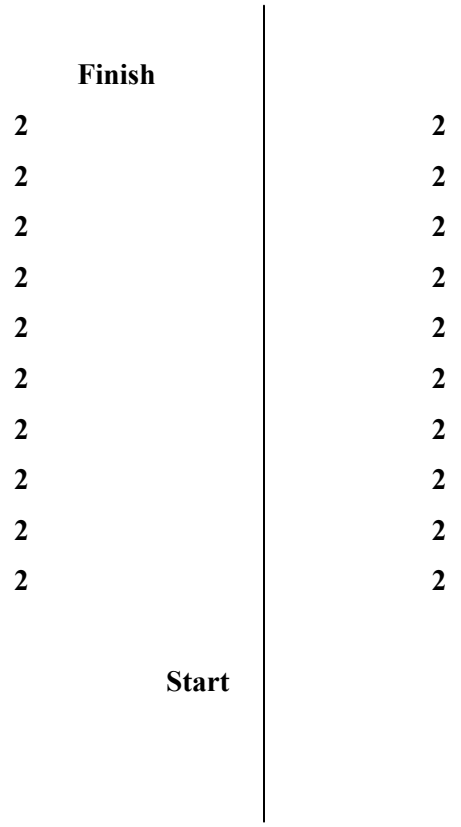


Figure 1. Figure 1 shows the game board used during instruction.

Table 2. *20 Questions: Tact and Textual Response Sets of Stimuli*

	Set 1	Set 2	Set 3	Set 4	Set 5
Participant A's Tacts & Participant B's Textual Responses	Mount Rushmore; Buckingham Palace	Bengal Snow Leopard, Siamese	Triceratops, Stegosaurus	Coelyphysus, Pteradactyl	Interplanetary Dust, Meteoroid
Participant A's Textual Responses & Participant	Coliseum, Arch de Triumph	Persian White, Sphinx	Brachiosaurus, Ankylosaur	Melanosaurus, Iguanadon	Meterorite, Eclipse

B's Tacts

Table 3 *Peer Tutoring with the Game Board Sets of Stimuli*

Participant	Set 1	Set 2	Set 3	Set 4	Set 5
A	Hemisphere, Foreign, Technology, Longitude, Absolute	6x3, 5x4, 4x3, 3x3, 4x7	9x2, 10x2, 5x0, 3x1, 10x1	Galaxy, Milky Way, Solar System, Blue, Supernova	Mantle, Oceanic Crust, Lava, Crust, Earthquake
B	Psychology, Existence, Attitude, Residence, Majestic	4x2, 4x4, 5x1, 3x2, 1x1	2x2, 8x2, 3x5, 2x1, 7x1	Water Cycle, Volcano, Plant Cell, Animal Cell, Photosynthesis	Lake, Plains, Forrest, Desert, Estuary

Table 4 *Group Instruction Sets of Stimuli.*

Set 1	Set 2	Set 3	Set 4	Set 5
Latitude, Isle, Atmosphere, Global, Peninsula	Industries, Dominoes, Abilities, Ashes, Memories	Mysteries, Volcanoes, Notches, Buffaloes, Scarves	Sheriffs, Stereos, Patios, Flamingoes, Halves	Western, Navigate, Distant, Tropical, Historical

The design implemented in this study was a multiple probe design. Pre-experimental probe sessions were conducted prior to implementation of the observational training procedure in each objective. The protocol included four objectives to teach components of observational learning. These objectives were (1) "I Spy"; (2) 20 questions: tact and textual responses; (3) peer tutoring; and (4) group instruction. Data were also collected on the dependent variable during probe sessions following each objective in the social listener game board protocol.

Dependent Variables. The dependent variables were defined as the number of (1) sequelics, (2) conversational units, (3) "Wh" questions (including who, what, where, when and why), (4) vocal approvals, and (5) vocal disapprovals emitted by both participants. A sequelic was defined as a speaker/listener exchange in which one participant emitted a vocal word or sentence and the other participant emitted a vocal word or sentence related to the first. This included intraverbal responses between the participants such as Participant A: "Who is this?" Participant B: "Barney", as well as speaker reinforcement such as Participant A: "I like blocks." Participant B: "Me too". A conversational unit was

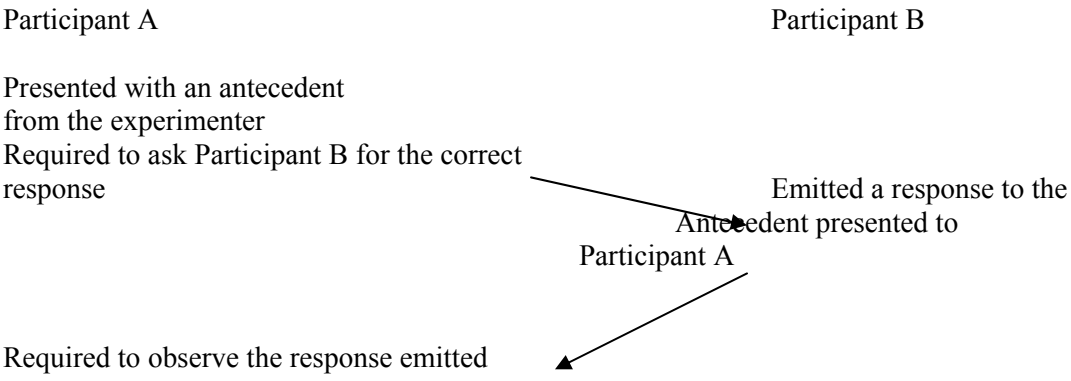
defined as a "Verbal behavior episode between two or more individuals in which both or all parties complete a three-term contingency as both speaker and listener and the reinforcer is the verbal behavior of another" (Greer, 2002, p. 341). During a conversational unit, both participants acted as both a speaker and a listener. An example of a conversational unit is Participant A: "Want to play with me?" Participant B: "yea." Participant A: "Ok, Let's play with blocks". Participant B "That will be fun."

A "Wh" question was defined as any question that began with who, what, where, when or why. A vocal approval was defined as any vocal praise or reinforcement emitted by the participant. Examples of vocal approvals included "Great job," "Wow, you did it," and "You're awesome". A vocal disapproval was defined as any vocal statement emitted by the participant that was disapproving. Examples of vocal disapprovals measured during the study included "Stop it!" and "No!"

Independent Variable. The independent variable in this study was observational training implemented in the social listener reinforcement game. The participants were presented with a game board that had two reinforcement paths, one designated for the participants and one for the experimenter. Each path was broken down into 10 spaces, with the number two written on each space. Each time the participant or experimenter moved up the path, they earned two points, and the winner earned a total of 20 points and earned the reinforcer at the end of the game board. The board was only presented to the two participants during group sessions. At the onset of each group session, the participants were presented with three heroes and were asked to select the hero they would be in the game. The experimenter selected a villain from three villains that corresponds with the chosen hero. All of the characters were taken from Disney® movies. Figure 1 shows an example of the game board used.

The game board was placed on a table. The participants sat next to each other and across from the experimenter at a table. Both participants could see both the experimenter and the game board at all times. During those sessions when the participants were required not to see each other, a blindfold was used alternating between participants.

Prior to each session with the game board, both participants were presented with the rules. The experimenter only accepted vocal responses by the participant who was presented with the vocal antecedent. The participants were required to ask each other one question and emit a speaker/listener exchange to emit correct responses and move one space forward on the game board. An example of the instruction is shown in Figure 2. The participant presented with the question could only ask one question one time and the participant presented with the answer was required to answer each question only once. If the participant presented with the questions emitted a correct response, both participants received reinforcement in the form of vocal praise and moved the hero they had selected up one space on the game board. If the participant who was presented with the question emitted an incorrect response, the experimenter moved the villain that she had selected up one space and cheered for her villain.



By Participant B and emit that response for
reinforcement or a correction from the experimenter

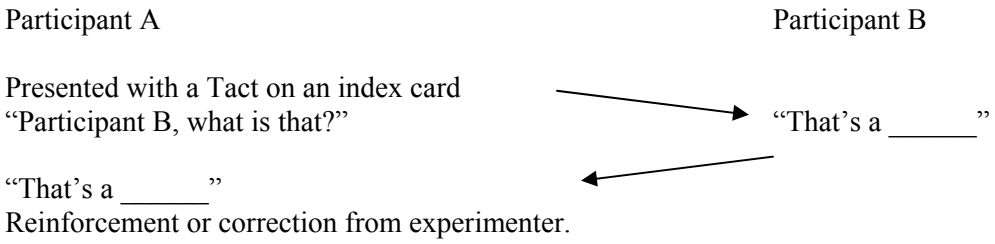


Figure 2. Figure 2 shows an example of the learn unit during game board instruction.

I Spy. The game sessions were conducted as follows. During "I Spy," the experimenter held up a picture that Participant A could see and which Participant B did not have access (Participant B was blindfolded). The pictures contained shapes and numbers. The experimenter held a picture of a circle up to Participant B. The experimenter presented a question to Participant B about the picture. For example, the experimenter said, "What shape is this?" Participant B was then required to ask Participant A a question in order to obtain the correct response to the question. Participant B asked Participant A" What shape is it? If Participant A said "circle" and Participant B told the experimenter "circle", the participants received verbal praise and moved their hero up one space. Participant B did not emit a correct response if she did not ask an appropriate question, did not listen to the response of Participant A, or if Participant A did not give Participant B the correct response. If Participant B did not emit a correct response to the question, the experimenter held up the picture so that both participants could see it and gave a vocal correction. Participant B was required to echo the correct response and the experimenter reminded the participants that they had to ask their friend for help in order to get the correct response. The experimenter moved up her villain one space on the game board and cheered. The criterion for the "I Spy" game was 90% correct for two consecutive sessions.

20 Questions. During "20 Questions: Tact and Textual Response" the experimenter held up a picture that both participants could see. The pictures contained the sets of stimuli listed in Table 2. For each instructional session each participant was taught two tacts and two textual responses. The experimenter held a picture of a breed of cat up to Participant A. The experimenter simultaneously held up the textual response of that cat to Participant B who had previously mastered textually responding to the printed word. Participant A was required to ask Participant B "What is it?" Participant B then told Participant A "Siamese", and Participant A was required to repeat "Siamese" in order to emit a correct answer and move up on the game board. Participant A did not emit a correct response if she did not listen to the response of Participant B, or if Participant B did not give Participant A the correct response. If Participant A did not emit a correct response to the question, the experimenter held up the picture so that both participants could see it and gave a vocal correction. Participant A was required to echo the correct response and the experimenter reminded the participants that they had to ask their friend for help in order to get the correct response. The experimenter moved up her villain one space on the game board and cheered. Criterion during this game was 90% correct for two consecutive sessions for observational learn units. The participants were required to observe the tacts of their peer and learn the tacts through

observational learning. When the participant emitted a correct response to a tact without asking their peer, they also moved up on the game board and received verbal praise.

Peer Tutoring with the Game Board. During "Peer Tutoring with the Game Board" the two participants engaged in peer tutoring in which they taught one another 5 sets of stimuli each, alternating between tutor/tutee roles. The participant who was the tutor presented a set of five stimuli which they had previously mastered. The sets of five stimuli were presented four times during a 20 learn unit peer tutoring session. During the game each participant had a 20 learn unit session. An example of the peer tutoring was as follows: Participant A (tutor) held up a card with the printed word "majestic". Participant B correctly responded "majestic" and Participant A reinforced the correct answer with verbal praise. The participant's game piece moved up on the game board when the target participant (tutee) emitted a correct response. The experimenter's game piece moved up on the game board when the target participant (tutee) emitted an incorrect response. When the target participant (tutee) met criterion set for 100% correct responses for one session for one set of stimuli, they moved on to another set of stimuli. Each participant mastered five sets of stimuli to a criterion of 100% correct responding for one session during the Peer Tutoring with the Game Board phase.

Group Instruction with the Game Board. During "Group Instruction with the Game Board", the two participants were partnered each with another participant in the classroom to form two teams. Team 1 was asked, "What word is this?" and had to discuss with their partner the answer. If Team 1 responded correctly, they moved up on the game board. If Team 1 responded incorrectly, Team 2 was given the chance to respond correctly and move up on the game board. If no one answered correctly, no one moved up on the game board. Then, the experimenter presented the next word to Team 2. Each team mastered all the sets of textual responses to a criterion of 100% correct responding for one session during Group Instruction with the game board.

Data Collection – Dependent and Independent Variable. Data were collected on the dependent variable using lined paper and a pen in 5-minute intervals. The experimenter began a timer at the beginning of each interval. The participants' speaker/listener exchanges were collected using event recording within each session. Each time Participant A emitted a vocal response, an A was recorded on the paper. Each time Participant B emitted a vocal response, a B was recorded on the paper. For example, if the participants emitted a sequelic, the data collected were AB. If the participants engaged in a conversational unit, the data collected were ABA. Data were recorded on the next line each time the topic of conversation changed. The number of "wh" questions, vocal approvals, and vocal disapprovals emitted by each participant were collected using event recording within each session. A tally mark was drawn in each column on the data sheet immediately after each was emitted.

Data were collected on the independent variable by recording a (+) for correct responses and a (-) for incorrect responses during each session for each of the four games. Data were blocked into 20 learn unit sessions. During the "20 Questions: Tact and Textual Response" game data were collected on observational learn units by recording a + with a circle around it. During the "Peer Tutoring with the Game Board" phase, data were collected by recording a + for correct peer tutoring and a – for incorrect peer tutoring, and by recording a circle around the + or – (for peer tutoring) for a correct response emitted by the tutee. Incorrect responses emitted by the tutee did not have a circle around the + or – for peer tutoring. During the "Group Instruction with the Game Board" phase, data were collected by recording a + for a correct response, and a – for an incorrect response. If the opposing team had the opportunity to answer the question after the first team responded incorrectly, a + or a – with a circle around it was recorded.

Interobserver Agreement. Observers for this study included the classroom experimenter, and two teaching assistants. Interobserver agreement was collected for 100% of baseline sessions. The

experimenter and a teaching assistant independently recorded the number of sequelics, conversational units, "wh" questions, approvals, and disapprovals emitted by each participant. Interobserver agreement was 100% for sequelics, 98% for conversational units, 100% for "wh" questions, 100% for vocal approvals, and 100% for vocal approvals. During intervention, Interobserver agreement was calculated for 17 of the sessions. Overall agreement was 100%. Interobserver agreement was calculated by dividing the number of agreements by the total number of agreements and disagreements and multiplying by 100.

Pre and post experimental probe procedures for 20 Questions: Tact and Textual Response, Peer Tutoring, and Group Instruction with the Game Board. During pre and post-experimental probe sessions, both pairs of participants were presented with all sets of stimuli. The experimenter held up index cards with pictures of stimuli and index cards with printed words. Pre- experimental probes showed the participants did not have the tacts or textual responses already in their repertoire. Post-experimental probes tested for the acquisition of the tacts and textual responses through the game board procedures.

Tactic Procedures- Treatment Phase. The tactic used in this study was observational training implemented in the social listener reinforcement game using the game board to teach social listener reinforcement for speaker listener exchanges. Data were blocked into 20 learn unit sessions. The experimenter presented vocal antecedents to both Participant A and B in an alternating manner. The game was played until either the experimenter game piece (the villain) or the participant game piece (the hero) reached the end on the game board. The game was played four times during each session.

Results

Pre-Experimental Probe Sessions. Participant A emitted 0 "wh" questions, approvals, conversational units, and sequelics, and 4 disapprovals during the pre-experimental 5 minute probe sessions in the play area as shown in Figures 3 and Table 5. Participant B emitted 0 "wh" questions, approvals, disapprovals, conversational units, and sequelics during the pre-experimental 5 minute probe sessions in the play area as shown in Figure 3.

FIGURE 3, NEXT PAGE!

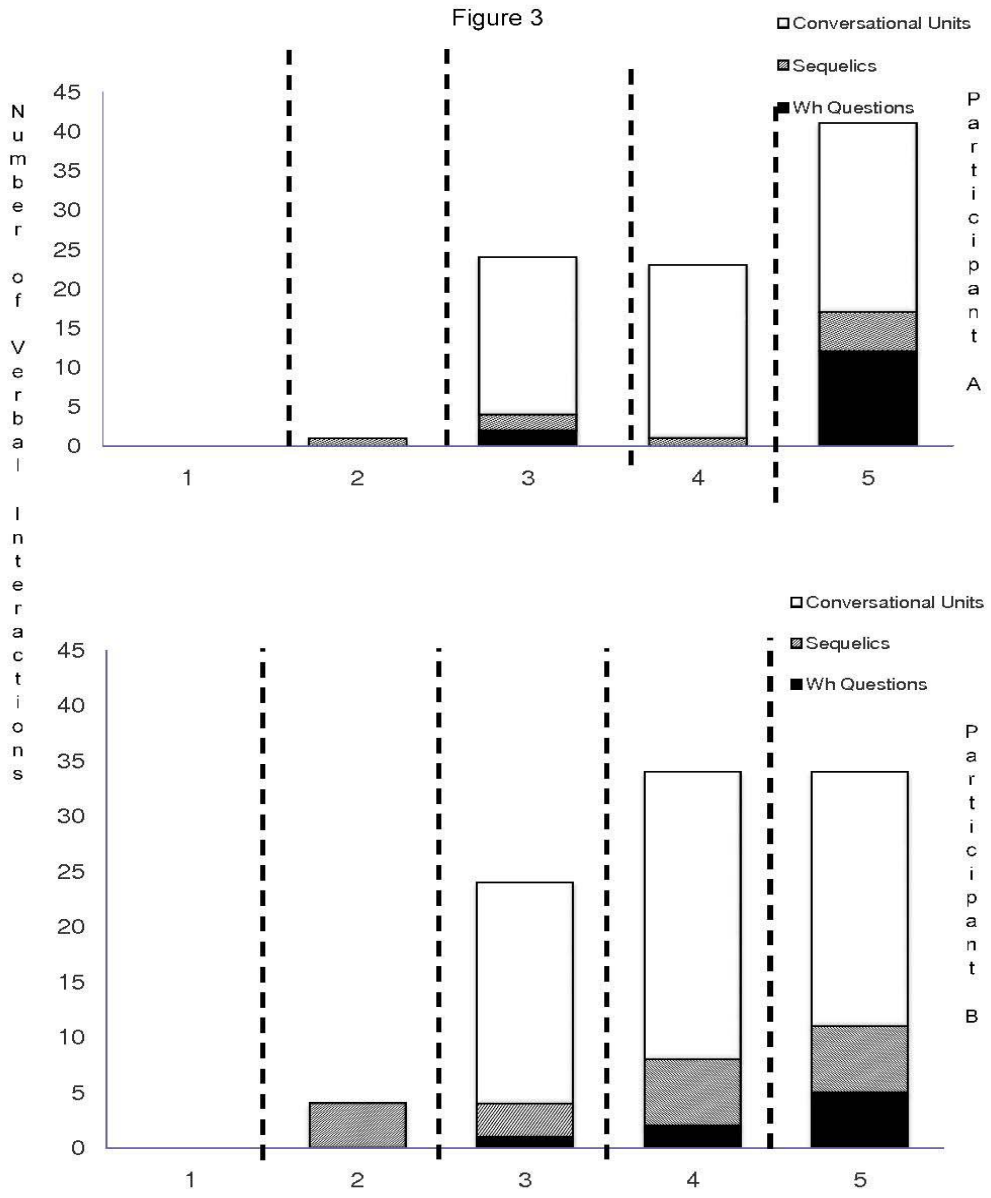


Figure 3. Figure 3 shows the total number of verbal interactions, "wh" questions, sequelics, and conversational units in the play area for Participant A and B are demonstrated.

Table 5.

Approvals and Disapprovals Emitted During Play Area Probe Sessions.

Participants		Approvals	Disapprovals
Participant A	Pre-probe	0	4
	Post-probe 1	0	1
	Post-probe 2	0	2
	Post-probe 3	0	0
	Post-probe 4	0	0
Participant B	Pre-probe	0	0
	Post-probe 1	1	1
	Post-probe 2	2	0
	Post-Probe 3	0	0
	Post-Probe 4	2	0

Criterion. During the implementation of the observational training listener reinforcement game for "I-Spy", the participants met criterion, specified as 90% for two consecutive sessions, after 2 sessions. During the implementation of the observational training listener reinforcement game for "20 Questions: Tact and Textual Response," the participants met criterion, specified for 90% for two consecutive sessions of observational learn units, for all sets of stimuli after 15 sessions (Table 6). During the implementation of the observational training listener reinforcement game for "Peer Tutoring with the Game Board," the participants met criterion, specified for 100% for one session for all sets of stimuli after 14 sessions. During "Group Instruction with the Game Board", the participants met criterion after 19 sessions (Table 7). Tables 6 and 7 show the pre and post probe data collected on each set, demonstrating mastery of the instructional material.

Table 6. *Pre and Post Instructional Probes for all Sets of Stimuli During "20 Questions: Tact and Textual Response"*

	Participant A	*Participant B*

Table 7.

Pre and Post Instructional Probes for all Sets of Stimuli During "Peer Tutoring

	Pre	Post	Pre	Post
Monuments				
Textual	0	20	0	20
Responding				
Tacts	0	20	0	20
Cats				
Textual	0	20	0	20
Responding				
Tacts	o	19	0	20
Dinosaurs #1				
Textual	0	15	0	12
Responding				
Tacts	0	17	0	20
Dinosaurs #2				
Textual	0	20	0	20
Responding				
Tacts	0	19	0	20
Solar System				
Textual	0	20	0	20
Responding				
Tacts	0	20	0	20

	Participant A		*Participant B*	
Set 1	Pre	0	Pre	0
	Post	20	Post	20
Set 2	Pre	0	Pre	0
	Post	18	Post	20
Set 3	Pre	0	Pre	0
	Post	20	Post	20
Set 4	Pre	0	Pre	0
	Post	17	Post	20
Set 5	Pre	0	Pre	0
	Post	18	Post	18

Post I Spy. During the 5 minute probe session in the play area following the implementation of the "I Spy" listener reinforcement game data show a slight increase in sequelics and a decrease in

disapprovals for Participant 1 as shown in Figure 3 and Table 5. She emitted 1 sequelic and 1 disapproval. Data also show an increase in the number of approvals, disapprovals, and sequelics for Participant 2 as shown in Figures 3 and Table 5. She emitted 1 approval, 1 disapproval, and 4 sequelics.

Post 20 Questions: Tact and Textual Response

During the 5 minute probe session in the play area following the implementation of the "20 Questions: Tact and Textual Response" listener reinforcement game, the data showed a significant increase in the total number of verbal interactions in the play area for both participants as shown in Figure 3. The number of conversational units significantly increased for both participants. Participant A emitted 20 conversational units and 2 sequelics. She also emitted 0 approvals and 2 disapprovals as shown in Table 5. The number of disapprovals decreased from the first 5-minute probe. Participant B emitted 20 conversational units and 1 sequelic. She also emitted 2 approvals and 0 disapprovals.

Post Peer Tutoring. During the 5 minute probe session in the play area following the implementation of the "Peer Tutoring with the Game Board" listener reinforcement game, the data showed a significant increase in the total number of verbal interactions in the play area for both participants as shown in Figure 3. Specifically, the number of conversational units has significantly increased for both participants. Participant A emitted 22 conversational units and 1 sequelic. She also emitted 0 approvals and 0 disapprovals as shown in Table 5. The number of disapprovals decreased from the first 5-minute probe. Participant B emitted 26 conversational units and 6 sequelics. She also emitted 0 approvals and 0 disapprovals.

Post Group Instruction. During the 5-minute probe sessions in the play area following "Group Instruction with the Game Board", the total number of verbal interactions increased to 41 interactions for Participant A and 36 interactions for Participant B as shown in Figure 3. Participant A emitted 24 conversational units, 12 "Wh" questions, 0 approvals, 0 disapprovals and 5 sequelics as shown in Figure 3. Participant B emitted 23 conversational units, 5 "Wh" questions, 2 approvals, 0 disapprovals, and 5 sequelics as shown in Figure 3 and Table 5.

Discussion

The study resulted in an increase in the number of conversational units in the play area after the implementation of the observational training procedures in which elementary school participants were taught the listener reinforcement component in the listener speaker exchange. The participants in this study also engaged in peer tutoring and learned through the observational system of instruction during this study. This may have also helped in increasing the number of conversational units for both participants.

As participants developed the reinforcement component of speaker listener exchanges, there was an increase in the number of conversational units emitted by each participant. That is, the participants used verbal behavior to interact with their peers to make contact with their environment.

The authors propose that empathy is an extension of the development of listener reinforcement. The observational training procedures resulted in increases in the number of verbal interactions. However, it became necessary for the participants to acquire perspective taking to further extend their conversations. Therefore, empathy instruction was implemented to teach students appropriate emotions.

Experiment 2

Experiment 2 investigated the effects of a multiple exemplar instructional procedure on the participants' development of empathy. Multiple exemplar instruction included teaching all repertoires

using learn units that were rotated across responses (Greer, Stolfi, Chavez-Brown, Rivera-Valdes, 2005). The authors propose that teaching students empathy, the capability to respond to contingencies in the environment that require an individual to take the perspective of others by accurately tacting others emotions, through multiple exemplar instruction would help to develop the participants listener and perspective taking capabilities.

Methods

Participants and Setting. The participants and setting in Experiment 2 were the same as those in Experiment 1.

Instructional Materials. During multiple exemplar instruction to teach empathy, pre and post probes were conducted on participants' responses to 20 pictures of people in situations expressing emotions and 20 real life situations in the classroom. Examples of pictures of people expressing emotions included adults and children crying, arguing, in pain, in fear, jealousy, etc. Examples of real life situations in the classroom included situations in which their teachers and peers were sick, in pain, were scared, etc. such as a teacher coughing, a student falling, students arguing, etc. The stimuli and real life situations used during probe sessions are shown in Table 8. Five sets of four pictures of people in situations expressing emotions were used during instructional sessions.

Table 8. *Stimuli used during empathy instruction*

Stimuli Used During Picture Probes	*Situations Used for Real Life Probes*
A boy hit by a car	A woman tripping over a chair
A woman wearing a neck brace	A woman coughing loudly
A mother and her daughter sitting together at a table and the mother is scolding the daughter who looks upset	A little boy screaming because he wants something that does not belong to him
A boy with a bandaged head	A student pulling a teacher's hair
A woman putting eye drops in her eye	A boy lying on a mat alone
A little girl with her arms folded while her parents argue in the background	A boy vomiting on the floor
A woman with her hand on her head	A student pulling on a teacher's shirt
A man lying face down floating in a pool	A boy hitting a girl on the back
A woman with a scrape on her leg	A girl pushing a girl and a boy to get to the table
A woman who fell down a flight of stairs and was lying on the ground	A boy biting a woman causing the woman to bleed
A woman holding the side of her face	A boy crying
A dog with bandages covering his head and paws	A student grabbing and eating food that doesn't belong to him
Two boys pulling on a girl's hair	A student misbehaving
A girl holding her stomach	A woman dropped a box of crayons that spilled all over the floor
A woman with a clothes pin stuck on her finger	A woman dropping a book that lands on her foot
A man blowing his nose	A woman stepping on a girl's foot
A girl sitting alone at one cafeteria table while another group of girls is whispering and looking at her from another table	Two teachers arguing about who is responsible for grading papers
An older boy squirting a younger boy with a water gun	A student angry at his teachers and screaming

A boy with a cast on his foot	A teacher getting a paper cut
A young girl in a hospital bed	Two girls arguing about the next activity they want to do together

Dependent Variables. During empathy instruction, the dependent variables were participants' responses to 3 questions: What happened? How does the person feel? What could you do to help? The participants were required to respond to each question appropriately. A correct response was recorded if the student accurately tacted the picture, emotion, and how they could help in the correct perspective.

Independent Variable. During empathy instruction, multiple exemplar instruction with learn units was implemented. The questions were rotated across stimuli. The questions included the following. What happened? How does the person feel? What would you do to help? Each set of stimuli included four pictures of situations of people expressing emotions. For example, the experimenter asked the participant to tact what happened in a picture of a boat sinking, followed immediately by a question to tact how a person who fell off their bike felt. Criterion was specified as 90% correct for two consecutive sessions across each question. If a participant mastered one question before the others, the experimenter continued to present the question in a rotating format but data were not collected on the participants' responses.

Data Collection. Data were collected on participants' responses to empathy questions to 20 pictures and 20 real life situations in the classroom. A "+" was recorded for each correct response and a "-" was recorded for each incorrect response.

Interobserver Agreement. During empathy instruction, interobserver agreement was calculated for 100% of probe sessions and for 30% of instructional sessions. Interobserver agreement was calculated in the same manner as in Experiment 1 and was 100% across all questions during probe and instructional sessions.

Design

A multiple probe design across students was implemented. Pre-experimental probes were conducted for Participants A and B to both pictures and in real life situations. Probe sessions consisted of 40 trials for each student; 20 real life probe trials and 20 picture probe trials. Multiple exemplar instruction was implemented as an instructional procedure to teach empathy. Post probes were conducted in the same manner as the pre-probe sessions after the participants met criterion on multiple exemplar instruction.

Pre and Post Experimental Probe procedures for Empathy Instruction. Data were collected on participants' responses to 3 questions: "What happened?" "How does the person feel?" and, "What could you do help?" across 20 pictures of people in situations expressing emotions and 20 real life situations in the classroom. The experimenter held up a picture or orientated the participant's attention to a situation in the classroom and asked the 3 questions vocally. No feedback was given during probe sessions.

Tactics: Instructional Procedures. Multiple exemplar instruction was implemented to teach empathy. The questions were rotated across stimuli. The questions included the following. What happened? How does the person feel? What could you do to help? Each set of stimuli included four pictures of situations of people expressing emotions. Sixty learn unit sessions were conducted in which each participant had the opportunity to respond to each question twenty times. Data were collected in learn units (Greer, 2002). Each correct response was immediately followed by positive reinforcement. Each incorrect response was followed by a correction procedure that the participant participated in.

Criterion was specified at 90% accuracy for two consecutive sessions for each of the three questions targeted for five sets of four pictures.

Results

During "Empathy Instruction", Participant A met criterion on all 5 sets after 15 sessions and Participant B met criterion on all 5 sets after 18 sessions. These data are shown in Figure 4.

Participant A emitted 15 correct responses to, "what happened?" 14 correct responses to, "How does the person feel?" and 5 correct responses to "What could you do to help?" during the pre-probe session of pictures as shown in Figure 5. This increased to 18, 17, and 17 correct responses respectively post multiple exemplar instruction to teach empathy. Participant A emitted 12 correct responses to, "What happened?" 8 correct responses to, "How does the person feel?" and 10 correct responses to "What could you do to help?" during the pre-probe session real life classroom situations as shown in Figure 5. This increased to 20, 20, and 20 correct responses respectively during the post probe.

FIGURE 4, NEXT PAGE!

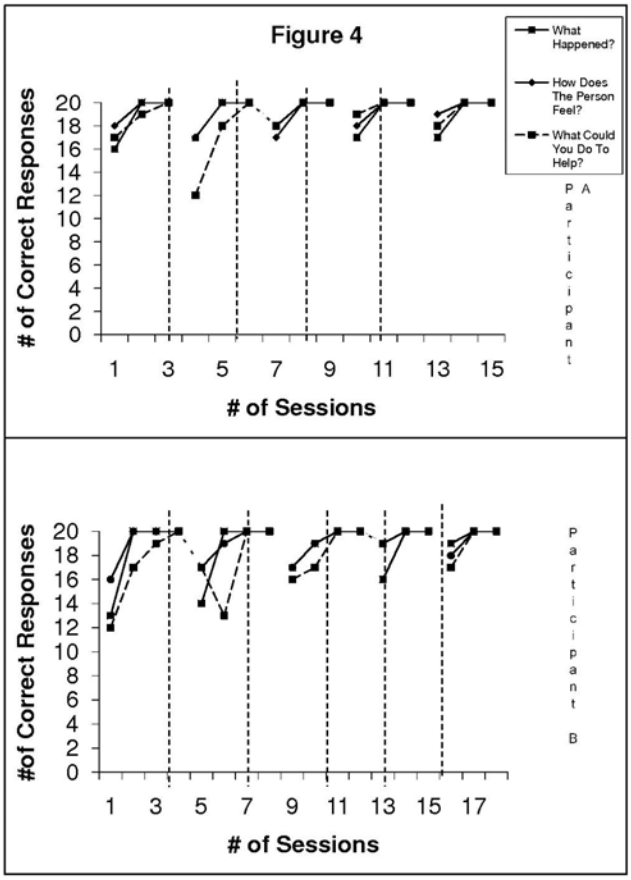


Figure 4. Figure 4 shows the data collected during multiple exemplar instruction to teach empathy for Participants.

FIGURE 5, NEXT PAGE!

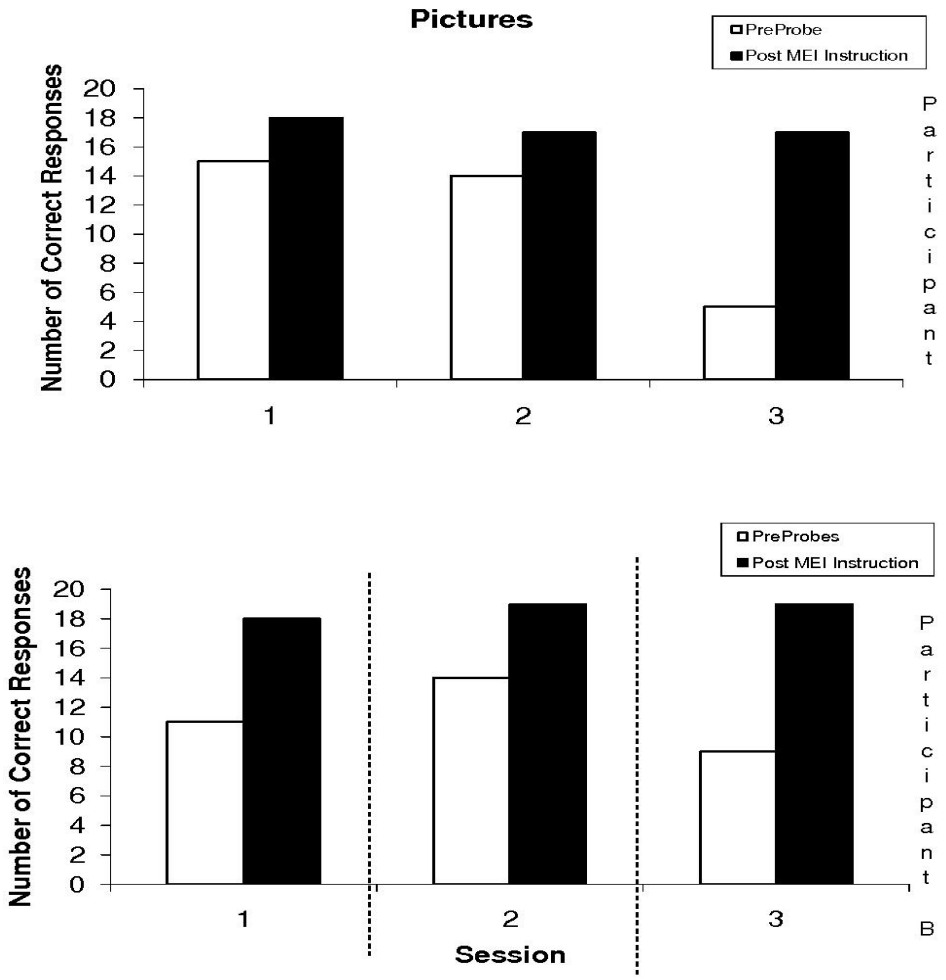


Figure 5. Figure 5 shows the number of correct responses to 20 pictures of people in situations expressions emotions during pre and post instructional session probes for Participants A and B

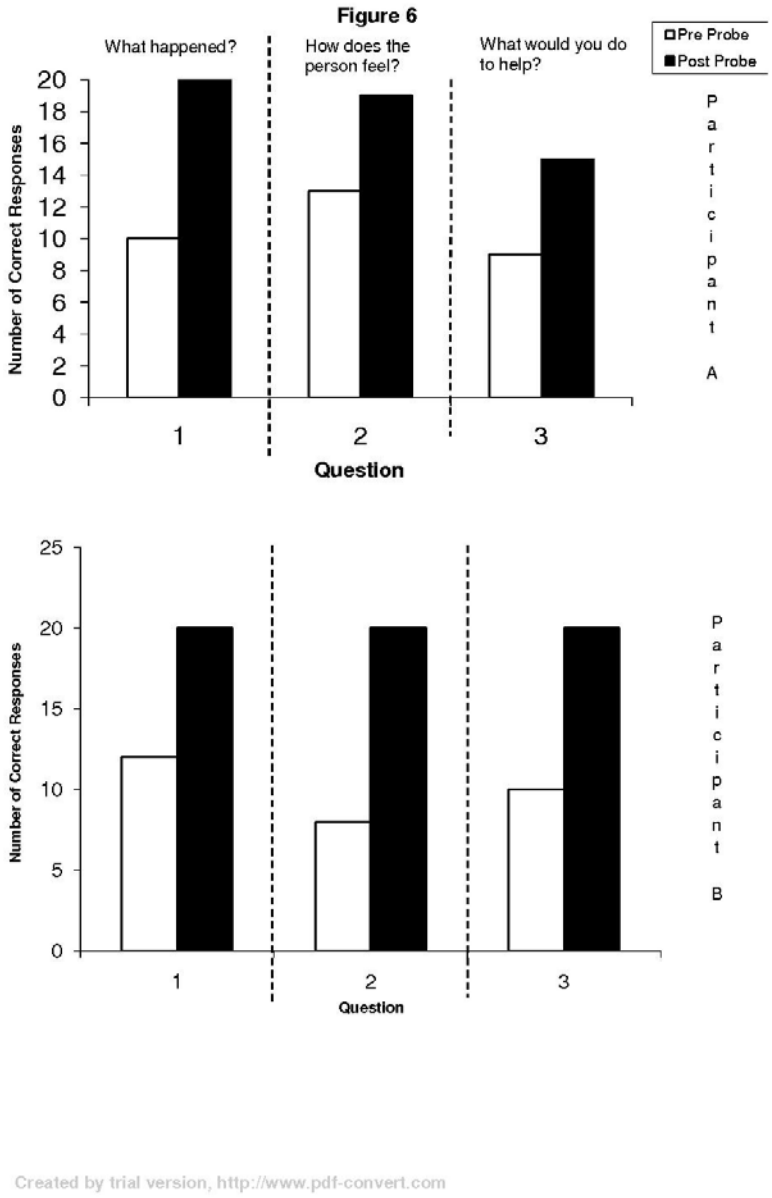


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Figure 6. Figure 6 shows the number of correct responses to 20 real life situations during pre and post instructional session probes for Participants A and B.

Participant B emitted 11 correct responses to, "What happened?" 14 correct responses to, "How does the person feel?" and 9 correct responses to, "What could you do to help?" during the pre-probe session of pictures as shown in Figure 6. This increased to 18, 19, and 19 correct responses respectively post multiple exemplar instruction to teach empathy. Participant B emitted 10 correct responses to, "What happened?" 13 correct responses to, "How does the person feel?" and 9 correct responses to, "What could you do to help? during the pre-probe session real life classroom situations. Figure 6 shows the increases in correct responses to 20, 19, and 15 during the post probe.

Discussion

Multiple exemplar instruction was effective in teaching participants to emit empathetic responses towards others. This was demonstrated by the increase in correct responses to all questions during post probe sessions. Students became aware of situations occurring in their environment and responded appropriately to the feelings of their peers. They mastered perspective taking and took the perspective of another person in both pictures and real life situations. Participants attended to their peers more often throughout the day and friendships began to develop.

General Discussion

This study investigated the effects of observational training procedures on the acquisition of reinforcement for listening. Skinner (1957) discussed the speaker's behavior in a verbal behavior exchange as mediated by the listener. In order to engage in conversational units (Greer, 2002), it is essential for an individual to act as both a listener and a speaker. Thus, it is essential to teach students with limited verbal interactions both components of the speaker listener exchange. The observational training procedure discussed here, including a yoked contingency, peer tutoring, and observational group instruction were successful in increasing the reinforcement for participants to listen to their peers. Listening was conditioned as a reinforcer for the participants.

The listening and understanding taught in Experiment 1 was a critical component of the development of empathy for the participants of this study. The authors propose that empathy is an extension of the listener reinforcement component of the speaker listener exchange. The effects of teaching the participants empathy were shown in the classroom in which the experiments were conducted. There were five students in the classroom diagnosed with autism, one student diagnosed with Mental Retardation, one student diagnosed with Emotional Disabilities and Selective Mutism, and one student diagnosed with speech/language delays. The participants in the study had several opportunities in the classroom to directly observe the behavior of others and to take the perspective of their peers and emit an appropriate empathetic response to the contingencies in the environment.

A limitation to this study was the small number of participants. Only two participants were selected for this study. Further research is needed in the area of the social reinforcement component of the listener/speaker exchange and how to teach empathy. This study should be replicated with more participants with and without diagnosed disabilities.

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