TEACHING CHILDREN WITH AUTISM TO IDENTIFY AND RESPOND APPROPRIATELY TO THE PREFERENCES OF OTHERS DURING PLAY

ADEL C. NAJDOWSKI

THE ABRITE ORGANIZATION PEPPERDINE UNIVERSITY

MEGAN ST. CLAIR

CENTER FOR AUTISM AND RELATED DISORDERS

JESSE A. FULLEN

PEPPERDINE UNIVERSITY

AMELIA CHILD

THE ABRITE ORGANIZATION

ANGELA PERSICKE

CENTER FOR AUTISM AND RELATED DISORDERS

JONATHAN TARBOX

FIRSTSTEPS FOR KIDS

We observed three children with autism spectrum disorder during structured play dates in which play partners displayed interest or disinterest in the toys with which they were playing. We then taught subjects to identify play partners' preferences and to make appropriate toy offers using a multiple-exemplar training package consisting of rules, midplay preference questions, prompting, and praise with observed generalization across untrained partners.

Key words: autism, multiple exemplar training, perspective taking, preference, theory of mind

Children diagnosed with autism spectrum disorder (ASD) often display deficits in socialization (DSM-5, American Psychological Association, 2013) including difficulty with responding to nonvocal social cues (Church, Alisanski, & Amanullah, 2000) and perseverating on their own idiosyncratic interests (Gilchrist et al., 2001). This may impact children's ability to play with peers if, for example, they do not attend to the nonvocal cues of disinterest in an activity exhibited by a play-partner. There has been a paucity of research on teaching children with ASD how to identify others' interests and preferences with two notable exceptions (e.g., Peters & Thompson, 2015; Stewart, Carr, & LeBlanc, 2007).

Peters and Thompson (2015) used a Behavioral Skills Training (BST) treatment package to teach children with ASD to tact nonvocal listener behavior as interested or uninterested, and, if uninterested, to ask questions and change to a topic more interesting to their conversational partner. For instance, the experimenter initiated a conversation by asking, "What have you been up to?" After some time, the experimenter turned her head away (indicating disinterest) and the participant was taught to ask the experimenter a new question regarding the topic already being discussed or to ask a question related to a new topic.

Participants learned this skill through behavioral skills training (BST; instructions, modeling, rehearsal, and practice) with multiple conversational exemplars until they maintained a conversation with the experimenter without requiring topic prompting.

Stewart et al. (2007) taught a boy with Asperger's syndrome to attend to the interests of his family members during conversation, also using a BST approach. Specifically, the participant was instructed to (a) maintain proper eye contact, (b) assess the conversational partner's interest (i.e., identify boredom exhibited by facial expressions), (c) solicit input from the partner regarding his or her interest, (d) change the topic if necessary, and (e) avoid topics that the participant frequently repeated. The family members then modeled the target behavior across several scenarios and the participant performed the target behavior during rehearsal scenarios with immediate feedback including descriptive praise and error correction.

Both of these previous studies taught children with ASD to attend to adults' engagement during conversations. We extended this research by examining procedures to develop similarly discriminated responding, but in the context of peer-play interactions. The purpose of the current study was to evaluate a training package to teach children with ASD to attend to, identify, and respond appropriately to others' preferences during play using a treatment model, similar to that of Peters and Thompson (2015) and Stewart et al. (2007).

METHOD

Participants and Settings

Three children diagnosed with ASD participated. Selena (7-year-old girl), Terry (8-year-old boy), and Vicky (5-year-old girl) were receiving behavioral intervention from a community-based Applied Behavior Analysis agency for 40, 20, and 12 hr per week, respectively. Selena received intervention at the

agency's center (2 hr) and at school (30 hr) in addition to receiving in-home services (8 hr). Terry and Vicky received all services in their homes. At the time of the study, assessment data were not available for Selena, but Vicky was performing at a level two and Terry at a level three in the Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP; Sundberg, 2008). All participants communicated in full sentences and had repertoires of listener behavior such as, echoics, mands, tacts (e.g., objects, actions, adjectives), intraverbals (e.g., objects, actions, adjectives, yes/no, locations, functions, prepositions, opposites, categories, pronouns, describe, negation), and rule-governed behavior as well as a history of learning via role-play requiring a sequence of up to four intraverbals. Participants were included because they tended to dictate what toys would be played with during play dates with peers, and parents were concerned that peers tended to lose interest in playing with their children. Specifically, participants did not seem to notice or respond to the preferences of their peers in play and failed to change their behavior according to indications of boredom or disinterest in an item or activity.

Procedure

Baseline/posttraining. We conducted one or two 45-min sessions per day, 1 to 4 days per week with play partners that included peers and adults. Each of these play sessions included two distinct assessment periods.

First assessment period. The first assessment period was intended to assess and teach participants to attend to the play of their play partners and to label their reactions to various toys. In each of these periods, children sat with a play partner (either a child or an adult) and six toys. These toys included a mix of toys the participant had previously nominated as either preferred or nonpreferred. The participant was prompted to present a toy to the play partner

and ask, "Would you like to play with this?" The play partners engaged in scripted reactions to the presented toys. These reactions included indicators of interest (saying, "Yes" or "Sure, I love that game" or by beginning to play with the offered material) or of disinterest (saying, "No" or "No, I don't like that game" or by engaging with an alternative toy). These reactions were semirandomly distributed each session across the six toys such that both the participant and play partner "liked" two of the toys, "disliked" two of the toys, and disagreed on two of the toys. In between each toy presentation, the participant and play partner had the opportunity to engage in cooperative play for 3 min with each toy or until the activity reached its natural ending (e.g., a game ending).

Once all six toys had been offered to the play partner, the experimenter asked the play partner to leave the room and interviewed the participant with postplay questions. Specifically, the experimenter asked, "What does (play partner) like to play with?" and "What does (play partner) not like to play with?". If the participant did not respond with at least three items to each question (irrelevant of accuracy), the experimenter prompted the participant to identify another toy by asking, "What else did she like to play with?", until either three items had been identified or the participant did not respond to the question within 5 s. The experimenter did not provide any feedback on the accuracy of the participant's report.

Second assessment period. The second assessment period was intended to assess and teach participants to respond to these indicators of preference during a simulated play date. These assessments occurred immediately following the first assessment period. The play partner knocked on the door and pretended to come over for a play date with two toys from home. The play partner initiated the play date by saying, "I brought some toys I like to play with from home: ____ and ____. Do you want to play (one of the toys) with me?". Throughout the remainder of the play date, the play partner made an indication of disinterest approximately every 3 min or when the activity came to a natural end. The indication of disinterest varied (e.g., "What should we do next?", "I'm kind of tired of playing this," "Can we do something else now?", etc.). The play partner's "preferences" for toys were programmed by experimenters and remained consistent with those displayed during the first assessment of each session but varied across sessions. The experimenter did not provide any feedback to the participant during these assessment periods.

Training. Training sessions were identical to those of baseline except that (a) the experimenter presented a unique set of six toys used exclusively for training, (b) play partners involved adults that were exclusively involved in training, and (c) the experimenter implemented an intervention package consisting of rules, prompting, and feedback.

First assessment period. Prior to initiating the first assessment period, the experimenter provided the rule, "Watch what (person) plays with. If (person) plays with it, s/he likes it. If (person) does not want to play with it, s/he doesn't like it." During the assessment session, once the play partner indicated whether he or she wanted to play with each toy, the experimenter presented midplay prompting by asking, "Does (person) like (toy)?" If the participant responded correctly, the experimenter provided praise. If the participant responded incorrectly, the experimenter provided additional prompting. The experimenter first reminded the participant of the rule and repeated the question (i.e., "Does [person] like [toy]?"). If they again responded incorrectly, the experimenter repeated the rule reminder combined with the leading question, "Is (person) playing with (toy)?" followed by "Does (person) like (toy)?" If the participant again responded incorrectly, the experimenter repeated the rule, repeated the question, and

provided a full echoic prompt (e.g., "Yes, she likes it" or "No, she does not like it.").

After the play partner was asked to leave the room, the experimenter again conducted the postplay interview and praised correct responses. Incorrect responses resulted in a two-step error correction. Specifically, the experimenter stated, "Remember, (person) didn't want to play with it. You need to tell me something (person) did want to play with." The second step involved providing a full echoic, such as, "(Person) liked to play with (toy)."

Second assessment period. The experimenter initiated the second assessment period by providing the rule, "Sometimes (person) will ask to play with something else. Don't ask (person) to play with things s/he doesn't like. Either ask him/her to play with something s/he likes or something new. If it is something new, ask (person) if s/he wants to play with it or if s/he likes it first."

As noted above, the play partner brought two toys he or she liked. The participant and play partner began playing with one of the toys brought by the partner and then approximately every 3 min (or when the activity ended naturally), the partner indicated that he or she wanted to play with something else. If the participant offered a toy or activity identified as preferred in the first assessment period, the experimenter provided praise and the children were permitted to play for up to 3 min. If the participant did not offer a preferred toy, the experimenter stated the rule, "If (person) plays with it, he or she likes it. If (person) does not want to play with it, he or she does not like it." All participants responded to this prompt accurately, so no further prompts were provided. The play partner continued to indicate wanting to play with something else approximately every 3 min. The session ended following play with five items.

Fading treatment components and mastery. After the participant was correctly answering assessment period 1's midplay questions pertaining to what the partner liked and disliked and was making appropriate toy offers on 80% or more opportunities during assessment period 2 for one session, the midplay question, "Does (person) like (toy)?" was omitted. After the participant continued to respond with 80% or greater accuracy for two consecutive sessions, the experimenter began omitting rules at the beginning of both assessment periods. We considered this skill set acquired when the participant exceeded 80% correct responding in the absence of midplay questions and rules.

Then, we conducted a generality probe with a novel peer play-partner using procedures described in baseline procedures (novel person probe). If the participant responded with at least 80% accuracy, we considered the skill mastered and moved into posttraining wherein we conducted generality probes with the same toys, novel experimenters, and procedures that were presented in baseline.

Natural environment (NE) probes. We also conducted a NE probe of a play date once each during baseline and generality probes for Terry and Vicky. During these probes, no instructions, reinforcement, or feedback of any kind was provided to the participant or the play partner. The participant and a novel child play-partner played until the partner naturally indicated liking and disliking five items. At that point, data collection on appropriate toy offers made by the participant began whenever the play partner naturally indicated wanting to play something else five times.

Response Measurement and Interobserver Agreement

During the first assessment period, the primary dependent variable was the accuracy of the participant's report of the play partner "liking" three items and "not liking" three items during the postplay interview questions. Thus, for each assessment period, the participant

received a score out of six possible items. An observer coded a *correct* for each toy with which the play partner played that the participant identified as "liked" and for each toy that the play partner refused that the participant identified as "disliked." An observer coded *incorrect* when the participant: (a) listed a toy the partner refused as "liked," (b) listed a toy the partner played with as "disliked," or (c) did not respond within 5 s.

During the second assessment period, the primary dependent variable was making an appropriate toy offer during the simulated play date. These sessions were divided into trials, with each toy offering opportunity constituting a trial. An observer coded a trial as correct if within 10 s of the play partner's indication of disinterest, the participant made an offer of (a) a toy the play partner had played with during the first assessment period, (b) a toy the play partner brought to the play date, (c) a toy the play partner said he or she liked, or (d) a novel toy. An incorrect trial involved offering a toy that the play partner refused in the first assessment phase, offering a novel toy to play with without asking the play partner if he or she wanted to play with the toy first, or not responding within 10 s of the play partner's indication of disinterest.

To assess interobserver agreement (IOA), a second, independent observer collected data during 70%, 44%, and 42% of sessions for Selena, Terry, and Vicky, respectively. We compared observers' records on a trial-by-trial basis and coded each trial as an agreement (both observers concurred on correct or incorrect) or disagreement. We then calculated IOA by dividing the total number of agreements by agreements plus disagreements and converting the quotient into a percentage. These calculations yielded mean agreement scores of 100% for the first assessment period and 98% (individual session range, 80% to 100%) for the second assessment period across participants.

RESULTS

During baseline, Selena (top panel of Figure 1) answered postplay questions (first assessment period) correctly between 0% and 17% of opportunities and made appropriate toy offers (second assessment period) during 0% of trials. During training, there was an immediate increase in correct responding across both measures, and she met our initial mastery criteria after six training sessions. Responding maintained at elevated levels as we removed midplay questions and rules. On session 14, she met the criterion of 80% for three consecutive sessions in the absence of rules; however, the data revealed that she was always asking play partners if they wanted to play with something new rather than asking them to play with items they had previously indicated as preferred. To ensure she was attending to previous preferences, we added a novel rule ("If she played with it before, that means she likes it. Sometimes you should ask her to play with things you have seen her play with before."). Selena immediately began to make offers based on play partners' preferences and this rule was removed on session 19. During the novel person probe and posttraining sessions, Selena responded 100% correct for both measures.

During baseline, Terry (middle panel of Figure 1) answered postplay preference questions between 0% and 17% of trials and made appropriate toy offers between 0% to 20% of trials. During training, there was an immediate increase in correct responding for both measures. Terry reached 80% to 100% correct for answering postplay preference questions and making appropriate toy offers during session 7, at which point the midplay preference questions were removed. During session 9, he met the criterion of two sessions at 80% correct in the absence of midplay preference questions, thus at this point, the rules were removed. On session 12, he met the criterion of 80% for three consecutive sessions in the absence of
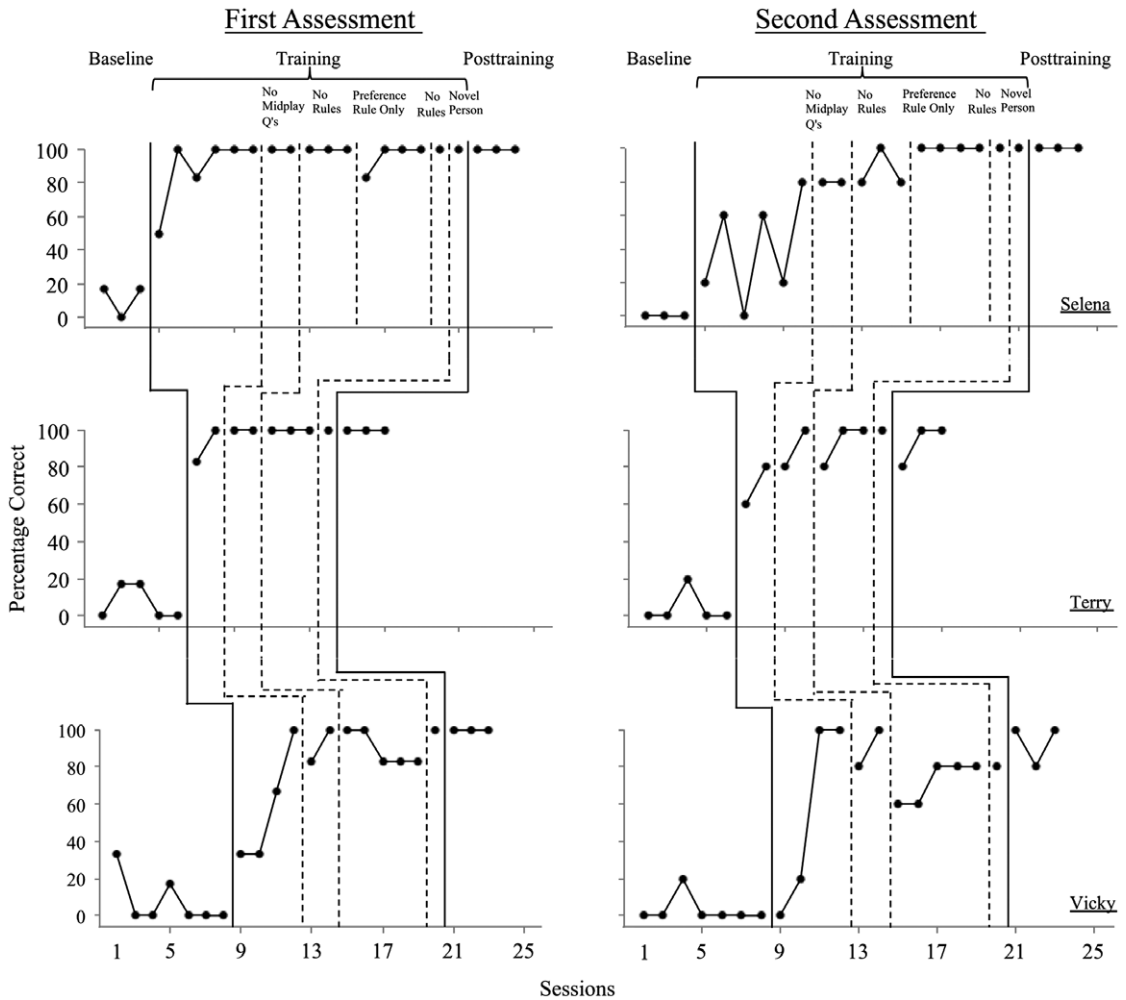
Figure 1.   Percentage correct (a) answering postplay preference questions about what play partners liked/disliked (left side of panels) and (b) making appropriate toy offers when play partners indicated wanting to play something else (right side of panels) during baseline, training, a novel person probe, and posttraining for Selena (top panel), Terry (middle panel), and Vicky (bottom panel).

rules. During the novel person probe and post-training, Terry responded 100% correct for both postplay preference questions and appropriate toy offers.

During baseline, Vicky answered postplay preference questions between 0% and 33% of opportunities and made appropriate toy offers 0% to 20% of trials. During training, there was an immediate increase in correct responding to answering postplay preference questions

and a gradual increase in appropriate toy offers. Vicky reached 100% correct responding for answering postplay preference questions and making appropriate toy offers in session 11, at which point the midplay questions were removed. During session 13, she met the criterion of two sessions at 80% correct in the absence of midplay preference questions. Thus, at this point, the rules were removed. On session 18, she met the criterion of 80% for three

consecutive sessions in the absence of rules. During the novel person probe and posttraining, Vicky responded between 80% and 100% correct for both postplay preference questions and appropriate toy offers.

Figure 2 represents percentage of appropriate toy offers during NE probes conducted pre- and posttraining for Terry and Vicky. Both participants made 0% appropriate toy offers during NE probes conducted prior to training. Subsequent to training, Terry and Vicky engaged in 100% and 80% appropriate toy offers, respectively.

DISCUSSION

A multiple-exemplar training package consisting of rules, midplay preference questions, prompting, and praise taught three children diagnosed with ASD to identify (measured via postplay preference questions in the first assessment) the preferences of adults and peers during play activities and to subsequently engage in discriminated toy offers during play periods (measured during the second assessment). Further, these repertoires generalized across untrained play partners who were not incorporated in training.

These results were similar to Peters and Thompson (2015) and Stewart et al. (2007) who taught individuals with ASD to first identify indicators of disinterest with conversational

Figure 2.   Percentage appropriate toy offers during NE probes for Terry and Vicky pre- and posttraining.

partners and then to modify their behavior in the presence of these social discriminative stimuli. Our study extended this model of intervention to younger children with ASD with a different social skill set (toy play offerings). Ours is the first study of which we are aware to use behavioral intervention to target preference identification during play in children with ASD and further highlights how behavioral interventions can be used to teach complex social skills to children with ASD.

The value of these social skills is found not in how well children offer toys to adults during scripted interactions, but instead how well they do so with same-aged peers during dynamic interactions without intervention. To that end, we assessed natural play periods with untrained peers prior to and following our intervention during NE probes with Terry and Vicky and saw substantive increases in performance following training. These results indicate that the skills targeted may generalize to natural play interactions. However, we conducted a limited number of observations of this performance under natural environment conditions, thus it is unclear if these skills are likely to maintain over time. Honoring a peer's preference involves volunteering to engage with a nonpreferred activity in lieu of a preferred activity and thus would result in degradation in reinforcement associated with peer play. During training, offering a toy the participant exclusively preferred was placed on extinction (attempts to do so would have resulted in corrective prompting), and thus the effects of these contingencies likely carried over into the NE probes. However, as play dates continue without intervention, it is possible that offering an exclusively preferred toy would intermittently contact reinforcement eventually resulting in reallocation to that toy during play interactions. Additional measurement would be necessary to determine maintenance of this skill across time.

It should also be noted that our training differed from a typical play date in that there was
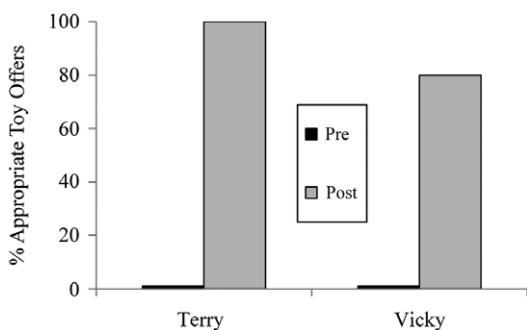
an initial observation period followed by an opportunity to offer preferred toys. In practice, this would involve participants nominating to return to a toy or activity to which their peer recently indicated disinterest (e.g., it had likely been engaged with to its satiation point). Given the duration of our sessions (or typical play dates—about 60 to 90 min) it may be reasonable to recycle some activities. It is also possible that children may learn their peers' preferences over time to more effectively nominate toys without initial observation periods. Future research should assess the social acceptability of the outcomes of this play intervention with peers. Researchers may examine peers' ratings of their enjoyment of playing with participants prior to and following treatment.

The current study employed both adult and child play partners during training who were not explicitly part of this research team. Therefore, they required ongoing training to ensure fidelity with training procedures. We did not specifically measure fidelity because we provided live, immediate prompting to ensure accurate implementation. Similar to our concerns regarding response maintenance, future research may evaluate the extent to which peers react similarly to our programmed responses and the necessity of those responses in maintaining participants' appropriate attending and offering. It is also possible that peers may engage in indicators of interest or disinterest other than those targeted in the current study; future research may assess generalization of participants' responding across novel indicators.

We also simultaneously targeted identifying the preferences of others (first assessment) and making appropriate toy offers (second assessment) during training. This resulted in acquisition of both skills, but it is possible training may have progressed more efficiently by training skills sequentially. It is also possible that training appropriate offers may have been unnecessary; that once participants learned to attend to and identify peer preferences that

they would then offer more preferred toys without direct intervention. Future studies may compare simultaneous and sequential training models in terms of efficacy and efficiency.

The skill of attending to others' preferences can be considered a component of perspective taking, or what other areas of psychology refer to as Theory of Mind (Baron-Cohen, Leslie, & Frith, 1985). These skill deficits are considered central to the diagnosis of ASD, and pervasive across many important social interactions that require identification of others' preferences such as when planning what gifts to get them or what activities and food items to include during a social event they will be attending. The current study demonstrated that at least some of these skills can be taught to children with ASD in the context of play; future research may consider similar training programs in the context of these other skills.

To the extent that the acquisition of offering preferred toys to peers will help children with ASD serve as a natural reinforcer for the play of their peers, it is hoped this intervention would lead to increased opportunities for social interaction. That said, children with ASD should not be required to continuously surrender their own preferences to their peers, as was the case in this study. Instead, we feel it will be important to also teach children skills such as reaching a consensus (e.g., identify toys we both like) or negotiation (e.g., we play your game first and then mine). These remain active areas of inquiry for our lab.

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