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Using video modeling to teach children with PDD-NOS to respond to facial expressions

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ABSTRACT

Children with autism spectrum disorders often exhibit delays in responding to facial expressions, and few studies have examined teaching responding to subtle facial expressions to this population. We used video modeling to train 3 participants with PDD-NOS (age 5) to respond to eight facial expressions: approval, bored, calming, disapproval, disgusted, impatient, pain, and pleased. Probes consisted of showing an adult performing these facial expressions in a video, and we conducted generalization probes across people and settings. Training was showing a video of an adult modeling a response to each facial expression. In the context of a multiple probe across behaviors design, two participants correctly responded to all facial expressions across people and settings after viewing the video models one or two times. Experimental control was achieved with the other participant though he required more training sessions and was less consistent with responding. Future researchers should evaluate ways to teach and test responding to facial expressions under naturalistic conditions.

1. Introduction

Responding to people's facial expressions is necessary for observational learning, showing empathy, and other social processes (Clark, Winkielman, & McIntosh, 2008; Ekman, 1984). Children with autism spectrum disorders (ASD) exhibit delays and deficits in responding to people's faces and emotions (Dawson, Webb, & McPartland, 2005; Kasari, Sigman, Yirmiay, & Mundy, 1993). Numerous studies have shown that when compared with typically developing children, children with autism have difficulty responding to facial expressions (e.g., happy, sad, angry; Grossman & Tager-Flusberg, 2008; Klin et al., 1999; Wright et al., 2008), recognizing emotions (Dyck, Ferguson, & Shochet, 2001; Rump, Giovannelli, Minshew, & Strauss, 2009), and perceiving gaze (Ashwin, Ricciardelli, & Baron-Cohen, 2009). Researchers have found that when looking at faces, typically developing individuals commonly look at people's eyes whereas individuals with autism look at people's mouths and inanimate objects (McPartland, Webb, Keehn, & Dawson, 2011; Riby, Doherty-Sneddon, & Bruce, 2009; Spezio, Adolphs, Hurley, & Piven, 2007). To complicate matters further, facial expressions often have durations lasting microseconds, and children with autism have more difficulty recognizing faces when presented rapidly (Beall, Moody, McIntosh, Hepburn, & Reed, 2008; Clark et al., 2008). Finally, functional magnetic resonance imaging (fMRI) has shown that the amygdala, fusiform gyrus, and other parts of the brain have different types of activity when people with autism versus people of typical development look at faces (Ashwin, Baron-Cohen, Wheelright, O'Riordian, & Bullmore, 2007; Ishitobi et al., 2011; Kleinhans

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et al., 2008; Ogai et al., 2003; Pelphrey et al., 2002; Wang, Dapretto, Hariri, Sigman, & Bookheimer, 2004). Because responding to facial expressions is critical for succeeding in social situations, research is needed to identify ways to teach this repertoire.

Teaching empathy skills and perspective-taking to children with ASD has gained recent empirical attention (Gena, Krantz, McClannahan, & Poulson, 1996; Harris, Handleman, & Alessandri, 1990; Reeve, Reeve, Townsend, & Poulson, 2007; Schrandt, Townsend, & Poulson, 2009). Schrandt et al. used a treatment package to teach 4 children with autism to emit empathic statements in the context of pretend play. The stimuli were dolls and puppets who emoted sadness/pain, happiness/excitement, and frustration. For example, the experimenter took a doll and had it bump the table and say, "Ouch." A correct response was "Are you ok?" and patting the puppet. The training package consisted of prompt delay, modeling using scripts, manual prompts, behavioral rehearsals, and reinforcement. In the context of a multiple baseline across participants design, this package increased the participants' frequencies of empathy responses. Generalization of empathic responding across stimuli and to actual people was observed. Two limitations of this study were the use of dolls and puppets as teaching agents and the use of a large treatment package.

In a study using a narrower set of interventions, Bernad-Ripoll (2007) used self-as-model videos and social stories to teach a 9-year-old boy with Asperger's syndrome to recognize his own emotions. The boy was shown videos of himself engaging in common activities (e.g., making his bed) with either a positive or negative emotional affect. Targeted emotions included frustration, happiness, anxiety, boredom, calmness, anger, and excitement. In the probe, he was asked, "How are you feeling?" "Why did you feel like this?" and "What should you do next time?" The intervention was showing the boy social stories with pictures and text explaining the emotions he was feeling. Food and preferred outings were used to reinforce watching the videos. The intervention increased the percentage of times the boy correctly labeled his emotions and the percentage of correct explanations and action responses. These effects were evaluated in an AB design, a limitation of the study. There was evidence of generalization of the target behaviors to situations that arose incidentally.

The use of videos was an interesting feature of the study by Bernad-Ripoll, though no studies were found that used video modeling to teach children to respond to facial expressions. Video modeling is an intervention in which a video of an adult, another child, or oneself demonstrating desired behaviors or skills is shown to a target individual (see Bellini & Akullian, 2007 for a review). Researchers have used video modeling to teach play skills (Blum-Dimaya, Reeve, Reeve, & Hoch, 2010; Boudreau & D'Entremont, 2010; Hine & Wolery, 2006; MacDonald, Sacramone, Mansfield, Wiltz, & Ahearn, 2009; Nikopoulos & Keenan, 2007; Palechka & MacDonald, 2010; Paterson & Arco, 2007; Reagon, Higbee, & Endicott, 2006; Sancho, Sidener, Reeve, & Sidener, 2010), self-help skills (Bidwell & Rehfeldt, 2004; Cannella-Malone et al., 2011; Mechling, Gast, & Gustafson, 2009; Rosenberg, Schwartz, & Davis, 2010; Shipley-Benamou, Lutzker, & Taubman, 2002), social skills (Buggey, Hoomes, Sherberger, & Williams, 2011; Tetreault & Lerman, 2010), imitation skills (Cardon & Wilcox, 2011; Kleeberger & Mirenda, 2010), conversation skills (Scattone, 2008), iPod use (Hammond, Whatley, Ayres, & Gast, 2010; Kagohara, 2011), vocational skills (Allen, Wallace, & Renes, 2010), transition skills (Cihak, 2011; Cihak & Ayres, 2010; Cihak, Fahrenkrog, Ayres, & Smith, 2010), and reading skills (Marcus & Wilder, 2009). Video modeling has been effective with children with autism, perhaps because they often enjoy watching videos. In the area of emotions and facial expressions, three studies were found that used video modeling to teach perspective-taking skills to children with autism (Charlop-Christy & Daneshvar, 2003; Charlop-Christy, Le, & Freeman, 2000; LeBlanc et al., 2003).

Perspective-taking involves identifying what another person is thinking, and requires observation of subtle social situations similar to responding to facial expressions (Sigman & Capps, 1997). The Sally-Anne false-belief task is a common way to detect perspective-taking (Baron-Cohen, Leslie, & Frith, 1985). In this task, a child is shown two puppets that "see" an adult put an object under a bowl. One puppet "leaves," and the adult puts the object under a cup. When the puppet "returns," the child is asked where the puppet thinks the object is. If the child says, "cup," there is evidence of a delay in perspective taking. LeBlanc et al. (2003) used video modeling to teach three children with autism to respond to this task and two similar tasks. The video modeling consisted of an adult performing the task with the camera zooming in on relevant parts. The experimenter paused the video at points to ask the participant to repeat the responses modeled in the video. Increases in correctly responding to false-belief tasks in the absence of modeling or feedback were observed for the three participants in the context of a multiple baseline across tasks design.

The purpose of the current study was to extend the research on teaching children with autism to respond to facial expressions. The participants' teacher reported that they could respond to simple facial expressions (e.g., sad, happy, surprised, angry), but not to more subtle facial expressions such as impatience, disgust, and approval. Many previous studies used static pictures or puppets, and we wanted to present the faces in videos, as in the study by Bernad-Ripoll. In many previous studies, labeling the facial expression was the dependent variable, whereas we were interested in teaching children to respond to facial expressions, as in the study by Schrandt et al. Video modeling was the only intervention we used, and another purpose of this study was to extend that literature. In addition to teaching the participants to respond to eight facial expressions, we assessed maintenance and generalization across people and settings.

2. Methods

2.1. Participants

Three pre-kindergarten children with independent diagnoses of Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS) participated. All three children were verbal and exhibited delays in social skills. All three children were