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Analysis of three components of affective behavior in children with autism

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ABSTRACT

Affective behavior is a crucial ingredient for appropriate, sustainable social interactions. People with autism have deficits in social interaction that are apparent in nonverbal behavior. Few studies have applied behavioral procedures to increase appropriate affective responding in people with autism. This study adds to that literature by examining three components of affective behavior, thus reinforcing the notion that it is not only what the learner says (verbal responding), but also how she says it (vocal intonation); not only whether the learner makes eye contact with his conversation partner, but also how he presents himself (facial expression). A multiple-baseline design evaluated the effects of an affect-training program on the percentage of appropriate responding emitted by three children with autism. The program consisted of reinforcement, prompting, script-fading, and shaping procedures. The percentage of appropriate affective responding emitted by participants across categories increased systematically following treatment; so did performance on nonreinforced probes.

Darwin (1872/2009) is said to be the first to present observers with photographed facial expressions and ask what they communicated. Emotions serve multiple functions, the most important of which is the "communicative aspect of emotional expression" (Knapp, 1963, p. 323). Whereas "emotion" refers to a private event, "affect" refers to the expression of emotion; behavior that "includes observable aspects of a person's facial, verbal, postural, and gestural response repertoires" (Gena, Krantz, McClannahan, & Poulson, 1996, p. 291). Facial expressions, vocal intonation, postures, and gestures constitute nonverbal affective displays that have important social-communicative functions. They help the viewer make inferences about a person's emotional or physiological state, and they can set the occasion for social interactions to occur (Gena et al., 1996). In his introduction to the third edition of Darwin's (1872/2009) manuscript concerning the expression of emotions, Ekman stated that of all nonverbal displays, facial expressions and vocal intonation were at the heart of the expression of emotion.

Deficits in these forms of expression in people with autism hinder appropriate responding essential for the initiation and maintenance of social interactions (Gaylord-Ross, Haring, Breen, & Pitts-Conway, 1984; Krantz and McClannahan, 1993; McEvoy et al., 1988; Rutter and Schopler, 1987; Yirmiya, Kasari, Sigman, & Mundy, 1989). Rutter (1966) noted that children

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with autism avoided eye contact with others and showed little or no interest in people, often looking past or away from them, which tends to present children with autism as "markedly aloof and distant" (p. 57). In their attempts to reverse the effects of this outcome, behavior analysts have implemented procedures that taught children with autism to use gestures in nonverbal communication (Buffington, Krantz, McClannahan, & Poulson, 1998), to engage in pro-social behavior (Reeve, Reeve, Townsend, & Poulson, 2007), and to display appropriate affect (Argott, Townsend, Sturmey, & Poulson, 2008; Gena, 1994; Gena, Couloura, & Kymissis, 2005; Schrandt, Townsend, & Poulson, 2009). The present study contributes to that literature, replicating and expanding upon the affect studies.

Gena (1994) noted that individuals with autism do emit affective responses, but that they often do so non-contextually. This stimulus-control matter lay at the heart of Gena et al.'s (1996, 2005) studies, whose main premise was that, "When considered within the broader context in which they are emitted, affective responses can serve as discriminative stimuli for the use of such modifiers as happy, sad, surprised, dismayed, and puzzled – terms that are used to draw inferences about a person's emotional or physiological state" (Gena et al., 1996, p. 291). Gena et al.'s (1996) used in vivo modeling, verbal prompting, and reinforcement to teach youths with autism to emit affective behavior in a contextually appropriate manner at their schools. To these, Gena et al. (2005) added video-modeling to teach preschoolers with autism to engage in appropriate affective responding at their homes. In both studies, Gena referred to sets of discriminative stimuli as "scenarios," which she defined as questions or statements provided by the therapist (Gena et al., 1996). To respond to a scenario, participants were trained to emit an experimenter-specified verbal statement that was contextual with the affective stimuli and a nonverbal response that matched that displayed by the experimenter. The nonverbal response was limited to facial expressions in Gena et al.'s (1996) study and included matching vocal intonation in the 2005 study. Both studies demonstrated that operant procedures were effective in teaching appropriate affect across categories.

Schrandt et al. (2009) demonstrated that prompting, modeling, behavioral rehearsals, and reinforcement were effective in teaching empathy skills in a pretend-play setting to children with autism. Empathy skills consisted of a contextually appropriate verbalization and motor response (e.g., patting arm) emitted in response to an affective initiation displayed by a doll or puppet. Limited generalization of effects to real people was demonstrated. Sadness/Pain was the sole affective category trained with three of the four participants. A fourth participant received training on Happiness/Excitement and Frustration as well.

A study by Argott et al. (2008), also concerned with affective behavior of children with autism, targeted appropriate verbalizations to affective stimuli using a script-fading procedure. Facial expressions and gestures were presented as discriminative stimuli to which three children with autism were taught to verbally respond by emitting contextual empathetic statements.

The primary purpose of this study was to systematically replicate and build upon the aforementioned studies on affect and thus use behavioral procedures, including prompting and reinforcement, to teach children with autism to emit appropriate verbal and nonverbal affective responses following experimenter social initiations. Conducting a replication of this type is important given that, as Gena et al. (2005) concluded, affective behavior of children with autism continues to be under-researched despite the instrumental roles comprehension and expression of emotion play in the occurrence of social behavior and development of social interactions.

The present study expanded upon Gena et al.'s (1996, 2005) studies in the following ways. First, with respect to nonverbal affective components, as stated above, Gena et al. (1996) examined the extent to which participant facial expressions matched those modeled by the therapist. Vocal intonation was not targeted in that study, but it was in Gena et al. (2005). There, too, participant facial expressions and vocal intonations were assessed based on their matching the model. The present study targeted both nonverbal components and attempted to define, more precisely, what constituted each. Therefore, the present study attempted to articulate the particulars of the components necessary for the expression of emotion and to teach children with autism to produce these components under the right stimulus conditions. The three components were targeted because each contributes to the production of appropriate affective responding. It is the combination of verbal and nonverbal components that helps to achieve this outcome (e.g., Banse and Scherer, 1996; Darwin, 1872/2009; Scherer, 1986).

Furthermore, Gena et al.'s (2005) categories included Appreciation, Disapproval, and Sympathy. The present study did not address Disapproval, but targeted Absurdities and Excitement, both of which had been targeted in Gena et al. (1996). Including them in the present study helped to examine a wider range of affective responses, particularly with respect to vocal intonation, which was not similarly assessed for these categories in either of Gena's studies. Therefore, the present study defined and measured vocal intonation, facial expressions, and verbalizations across four affective categories, namely, Responding to Absurdities, Expressing Empathy, Expressing Excitement, and Expressing Gratitude and Appreciation. It is noteworthy that the purpose of this study was not to examine whether each component was independent, but rather the extent to which each could be measured and learned separately. This would allow practitioners to identify what kinds of differences might be expected in the acquisition and generalization of affective responses.

In addition, participants whose affective behavior did not improve following treatment in Gena et al.'s (1996) Sympathy category were given alternative categories. The use of alternatives to difficult categories was not an option in the present study. Instead, extensive treatment phases were provided and a shaping procedure was used with two participants to make possible the acquisition of nonverbal components not in their repertoire, by determining precisely when the criterion for reinforcement needed to shift to responses that approximated terminal affective responding. Finally, while the present