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Increasing social approach and decreasing social avoidance in children with autism spectrum disorder during discrete trial training

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ABSTRACT

Instructions presented during discrete trial training (DTT) may evoke problem behavior and exacerbate social avoidance in children with autism spectrum disorder (ASD). Given the importance of DTT in comprehensive interventions, evaluating procedures to increase social responsiveness and approach during DTT are warranted. The effect of antecedent strategies on social avoidance during DTT in two children with ASD was examined. A pairing procedure in which one therapist removed demands and paired social interaction with access to preferred toys and activities was compared to a demand procedure in which a therapist presented instructions. Social approach was higher and social avoidance was lower in sessions with the pairing therapist compared to the non-pairing therapist during the Pairing Intervention and during post-pairing demand sessions.

1. Introduction

Autism spectrum disorder (ASD) is characterized by significant impairments in social communication and relationships as well as restricted, repetitive, and stereotypical patterns of motor movements and interests. In addition, several associated features of the disorder such as self-injurious behavior (SIB), aggression, hyperactivity, and non-compliance may emerge, often as a result of limited communication abilities (DSM-5; American Psychiatric Association, 2013).

Increasingly, social deficits are being viewed as the hallmark feature of ASD. Several researchers have found that social attention and orienting to social partners are impaired in children with ASD compared to their typically developing peers (Dawson, Meltzoff, Osterling, Rinaldi, & Brown, 1998; Dawson et al., 2004). The impairments in social attention have led some to suggest that ASD is characterized by a decrease in the reward value of social stimuli, which may result in reduced motivation for social interactions and reduced opportunities to learn from social stimuli (Dawson, 2008). Over time interactions with social partners may be experienced as neutral or potentially aversive resulting in increases in social impairments and social avoidance. These social impairments can be particularly problematic since children with ASD often require intensive behavioral interventions to develop adaptive and language skills. Thus, children with ASD spend a

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significant amount of time interacting with others (e.g., teachers, parents, clinicians) in an intensive, often one on one, instructional format.

Behavioral interventions are the most widely used interventions for ASD and have been found to improve functional language as well as decrease associated problem behaviors (Ahearn & Tiger, 2012; Dawson & Burner, 2011; Kasari & Lawton, 2010). One of the most extensively studied ABA-based procedures is discrete trial training (DTT; Smith, 2001). DTT is a brief instructional unit that consists of an instruction, a prompt, a response, a consequence, and an intertrial interval (Smith, 2001). This sequence is then repeated to provide opportunities to practice and to fade prompts to promote independent responding. Often DTT consists of short intervals (i.e., 1–5 min) of instruction followed by short breaks and then a larger break after a lengthier set of DTT (i.e., after an hour; Smith, 2001). DTT typically consists of one-to-one adult directed instruction and focuses on teaching new forms of behaviors and reducing problem behaviors (Dawson & Osterling, 1997; Newsom, 1998; Smith, 2001). Several research studies have shown that DTT results in significant gains in communication, academic skills, and social skills (McEachin, Smith, & Lovaas, 1993; Roxburgh & Carbone, 2012; Smith, 1999, 2001; Tarbox & Najdowski, 2008).

Though the positive effects and outcomes have been well documented in the literature, implementation of DTT has some limitations. Given that the onset of demands can evoke negative behaviors, teaching situations such as DTT may evoke the negative associated features of ASD. By requiring the child to sit and comply with instruction, the teaching environment becomes associated with demands and the child may begin to avoid the teaching environment and the teacher, which results in an uncooperative learner and negative behaviors motivated by escape. One way to address problem behavior during DTT is to focus on reinforcing compliance and ignoring noncompliance and attempts to escape the instructions (i.e., extinction; Piazza, Moes, & Fisher, 1996; Smith, 2001). Extinction involves the discontinuation of the contingency between a response (e.g., problem behavior) and a reinforcer (e.g., escape from demands; Iwata, Pace, Cowdery, & Miltenberger, 1994; Lattal, Peter, & Escobar, 2012). Although compliance may eventually be achieved, many children continue to verbally and physically resist instruction, refuse to sit for longer than a few minutes, or display subtler forms of avoidant behavior such as inattention and gaze aversion (Anderson, Taras, & O'Malley Cannon, 1996; Fovel, 2002). Thus, though extinction may reduce the problem behavior, the motivation that evoked the problem behavior may remain (Carbone, Morgenstern, Zecchin-Tirri, & Kolberg, 2007). Over time, even if problem behavior reduces, responding from the child may continue to be motivated and reinforced by escape from instruction and ultimately by escape from the therapist. In this case, the child may be repeatedly exposed to aversive social situations, potentially increasing social avoidance behavior (Koegel, Dyer, & Bell, 1987). Given the importance of including a DTT component in a comprehensive treatment program for children with ASD and the importance of promoting motivation for social interactions, methods to reduce the potentially negative effects of DTT while preserving this extremely important intervention are needed.

An alternative or adjunct to using extinction to address problem behavior is to manipulate antecedent variables. Manipulating motivational variables is an antecedent intervention and has been identified as an established treatment in the National Standards Project findings (National Autism Center, 2009). By including interactions between the instructor and the child that promote social approach and diminish social avoidance, interventions may begin to alleviate some of the social avoidance seen in children with ASD. In a series of experiments Koegel et al. (1987) found that children with ASD demonstrated low levels of social avoidance when interactions involved predominately child-preferred activities and play, and found greater social avoidance when interactions were dictated by the adult and included adult presented tasks. Further, Nadal, Martini, Field, Escalona, & Lundy (2008) demonstrated that children with ASD showed more approach behaviors toward adults following an intervention in which adults engaged in social behaviors, such as smiling, playfulness, and imitative behavior. Another study observed less social avoidant behaviors and greater eye contact during simple task demands when highly preferred music accompanied the tasks compared to a no-music condition (Finnigan & Starr, 2010). Thus, engaging children in highly preferred play activities may increase motivation for social interaction and reduce avoidance when instructional tasks subsequently need to be presented.

In the behavioral literature motivational variables are usually discussed as motivating operations (MO). An MO is defined as a stimulus that alters the value of something as a reinforcer and changes the frequency of behaviors associated with the reinforcer (McGill, 1999; Michael, 1982, 1993, 2000). In other words, an MO can increase (via establishing operation) or decrease (via abolishing operation) the value of something as a reinforcer and increase or decrease behaviors associated with access to that reinforcer. The concept of MOs, particularly the reflexive type, is important for interventions with ASD (Carbone et al., 2007).

Reflexive conditioned motivating operations (CMO-R) are previously neutral events that have been repeatedly followed by a worsening or improving set of conditions (Carbone et al., 2007; Michael, 1993; Shillingsburg, 2004). For example, a teacher presents academic materials to a child. The teacher was previously neutral and the presentation of the materials represents a worsening of conditions. The child engages in disruptive behavior and the teacher removes the academic material. With repeated interactions with the teacher, the teacher begins to act as a signal that academic demands will be made. The child may engage in these same disruptive behaviors at the sight of the teacher to terminate the interaction and avoid task demands. Sight of, or interaction with, the teacher is a CMO-R that establishes the termination of the interaction with the teacher as its own reinforcer and evokes behaviors (i.e., escape behaviors) that have been successful in terminating the interaction in the past. Thus, social avoidant behavior may develop.

To circumvent this type of negative CMO-R from being established, a procedure to establish rapport with a child prior to introducing demands may be effective (Smith, 2001; Sundberg & Partington, 1998). This type of procedure would serve as a