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Research in Autism Spectrum Disorders

The relative effects of social stories and video modeling toward increasing eye contact of adolescents with autism spectrum disorder

Roderick D. O'Handley, Keith C. Radley *, Heather M. Whipple

Department of Psychology, University of Southern Mississippi, Hattiesburg, MS, United States

A R T I C L E   I N F O

A B S T R A C T

The present study evaluated and compared the effects of social stories and video modeling on eye contact of adolescents with autism spectrum disorder (ASD). A multiple baseline design across participants with embedded changing conditions, counterbalanced across groups (A/B/B+C and A/C/C+B) was utilized to investigate the differential effects of social stories, video modeling, and a combination of social stories and video modeling. Results indicate that social stories presented in isolation resulted in moderate improvements in eye contact, with further improvements observed upon introduction of the combined social stories and video modeling intervention. Video modeling in isolation was found to result in strong intervention effects, with the addition of social stories yielding minimal additive effect. Implications for practice, limitations, and directions for future research are discussed.

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Autism spectrum disorder (ASD) is characterized by repetitive behavioral patterns and difficulties engaging in successful social interactions due to verbal and nonverbal communicative deficits (American Psychological Association, 2013). The social deficits exhibited by individuals with ASD are unlikely to diminish over time and may become more apparent as individuals with ASD enter adolescence and encounter increasingly complex social settings (Tantam, 2003). As the prevalence of individuals diagnosed with ASD has increased (Center for Disease Control, 2014), so has the need for effective and practical intervention procedures targeting associated social deficits.

The social deficits exhibited by individuals with ASD have been indicated as the most defining characteristic, regardless of language or cognitive abilities (Carter, Davis, Kiln, & Volkmar, 2005). Common verbal communicative deficits include difficulty sharing conversations (Elder, Caterino, Chao, Shacknai, & DeSimone, 2006), maintaining topics of conversation (Gutstein & Whitney, 2002), and inappropriate speech prosody (Starr, Szatmari, Bryson, & Zwaigenbaum, 2003). Nonverbal communicative deficits include difficulty recognizing facial expressions (Celani, Battacchi, & Arcidiacono, 1999) and sustaining appropriate eye contact (Pelios & Lund, 2001; Senju & Johnson, 2009).

It has been suggested that insufficient levels of eye contact represent a foundational nonverbal communicative deficit of ASD (Senju & Johnson, 2009) that is likely to restrict the development of other social skills (Donnelly, Luyben, & Zan, 2009), including other nonverbal communication skills. Koegel and Frea (1993), for instance, evaluated a pivotal response training

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* Corresponding author at: Department of Psychology, University of Southern Mississippi, 118 College Drive # 5025, Hattiesburg, MS 39406-001, United States. Tel.: +1 601 266 6748.
E-mail address: keith.radley@usm.edu (K.C. Radley).

procedure toward the acquisition and generalization of social communicative behaviors on other social behaviors and found that promoting eye contact facilitated the development of conversational topic maintenance as well as nonverbal mannerisms. In addition to promoting the development of other skills, the inability to sustain adequate eye contact is associated with noncompliance (Hamlet, Axelrod, & Kuerschner, 1984), and may negatively impact the academic performance of students with ASD given the importance of eye contact for attending to classroom instruction (Greer & Ross, 2007).

Given the associated detriments, researchers have evaluated a number of methods rooted in applied behavior analysis for promoting social skills, including eye contact. Social skills interventions are the most frequent intervention methods used to address both verbal and nonverbal social deficits of individuals with ASD (Goin-Kochel, Myers, & Mackintosh, 2007). The mechanisms facilitating the teaching of discrete skills typically include a combination of observation, modeling, and opportunities for skill rehearsal with positive and/or corrective feedback (Elliott, Roach, & Beddow, 2008). Two frequently used social skills intervention procedures include social stories and video modeling.

Social stories are brief, individualized narratives that describe social concepts or difficult social situations, and direction for successful and appropriate responses during those situations (Gray, 2000). Recent meta-analyses of social story interventions have indicated substantial variability of effects across studies (Kokina & Kern, 2010; Reynhout & Carter, 2006), with researchers suggesting that social story interventions may be more effective toward reducing inappropriate behaviors than increasing new social skills (Kokina & Kern, 2010). Despite this, Schneider and Goldstein (2009) suggested that social story interventions may be well suited to address deficits of eye contact, and there is evidence to suggest that social stories may promote eye contact deficits demonstrated by individuals with ASD. For instance, social stories using pictures were used to improve eye contact of a child with ASD (Pierson & Glaeser, 2007). In addition, Soenksen and Alper (2006) utilized a social story intervention to teach a young child with ASD to solicit the attention of peers by saying their name or by looking at their peer's face, finding the intervention to produce small to moderate improvements.

Similar to social stories, video modeling may be utilized to promote social skill use in individuals with ASD. Video modeling describes the procedure of having an individual watch a video of a model demonstrating a target behavior. There are a number of variations of video modeling procedures, including video self-modeling (Dowrick, 1999) and point of view video modeling, but the essential components are consistent across variations; namely, accurate skill demonstration. Video modeling interventions have been used to improve a variety of social deficits of individuals with ASD (Bellini, Peters, Brenner, & Hopf, 2007), including spontaneous requesting (Wert & Neisworth, 2003), perspective taking (LeBlanc et al., 2003), complex play sequences (D'Ateno, Mangiapanello, & Taylor, 2003), and social initiations (Buggey, 2012). Despite the flexibility of video modeling interventions, few studies have evaluated the effects of video modeling interventions with adolescents (Delano, 2007), with researchers findings results indicating that video modeling interventions may be less effective with older children relative to use with younger children (Wang, Cui, & Parrila, 2011).

In addition, few studies have evaluated the effects of video modeling interventions toward increasing eye contact. Tetreault and Lerman (2010) used point of view video modeling to teach three young children with ASD to initiate and maintain conversations with a partner. Three behavioral scripts were developed and introduced for training using a multiple baseline design, and participants were trained to provide eye contact and verbal exchanges with partners. The researchers suggested that point of view video modeling was moderately effective toward promoting eye contact of each participant, but additional procedures (i.e., edibles, prompting) were needed to promote other target behaviors. Mason, Rispoli, Ganz, Boles, and Orr (2012) also evaluated the effects of video modeling on two college students' eye contact, finding the intervention to produce large improvements in eye contact.

Scattone (2008) evaluated the effects of a combined intervention strategy using video modeling and social stories to improve several nonverbal communication skills, including eye contact, smiling, and initiations, of a 9-year-old boy with ASD. Using a social story developed according to Gray's (2000) guidelines, the social story text was filmed and narrated by an adult. The social story intervention was presented first, followed by the video modeling component, which demonstrated two adults using the target skills during a 5-min conversation. After viewing both intervention components, the participant answered comprehension questions and engaged in a 5-min social interaction session, while the percentage of 10-s intervals in which the participant demonstrated eye contact was calculated. Scattone found substantial improvements of eye contact from baseline (66%) to intervention (97%), and low to moderate effects were demonstrated for smiling and initiations.

Although favorable findings were indicated, Scattone's (2008) results should be interpreted with a number of limitations in mind. For instance, social stories and video modeling were implemented within a combined intervention, leaving questions as to whether either component contributed differentially toward improvement of eye contact, or whether a combined intervention may be more effective than either procedure used in isolation. In addition, Scattone evaluated skill generalization from clinic to school settings with a single baseline probe and a single probe following intervention, finding improved levels of target skills. However, minimal assessment of skill generalization and utilization of a combined intervention strategy left conclusions of generalization undetermined.

The issue of skill generalization is an important one, and remains one of the more challenging aspects of social skills training procedures for individuals with ASD (Barry, Klinger, Lee, Palardy, Gilmore, & Bodin, 2003). It has been suggested that promoting skill generalization may require the systematic methodological programming within intervention procedures (Baer, Wolf, & Risley, 1968). To this end, Stokes and Osnes (1989) suggested that practitioners incorporate natural contingencies within intervention procedures; train diversely by incorporating a sufficient number of discriminative stimuli, response examples, and multiple methods of training; and to incorporate functional mediators that may enable self-control